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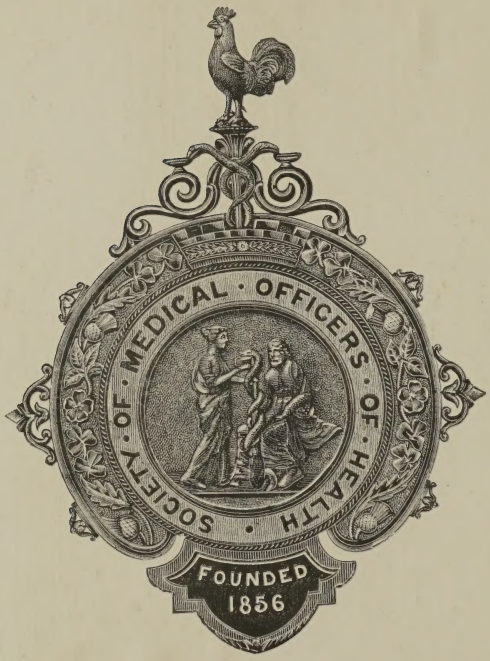

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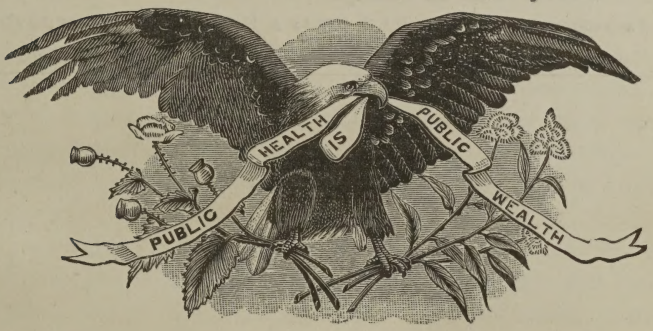
A MONTHLY MAGAZINE

DEVOTED TO THE

PRESERVATION OF HEALTH, MENTAL AND PHYSICAL CULTURE.



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THE SANITARIAN.

JANUARY, 1887.

NUMBER 206.

HEALTH INSURANCE, OR THE FINANCIAL RELATION OF THE MEDICAL PROFESSION TO THE PUBLIC.*

By WOODS HUTCHINSON, A.M., M.D., Lecturer on Hygiene, Iowa College of Physicians and Surgeons, Des Moines, Iowa.

IF I were to put the question to this august representative assembly, "What is the most annoying and unpleasant feature of our professional work, from what source spring our most harassing, though comparatively petty cares and our most provoking disappointments?" I think I should have no difficulty in determining, even if all spoke at once, that what we may call the financial question in medicine enjoyed that "bad eminence" more generally than any other which could be suggested. No doubt much of this difficulty and unpleasantness is inherent in the very nature of the process; for this is the point of metamorphosis at which our talent and industry must be coined into their equivalent of hard cash, where our lofty ambitions, noble aims, or Utopian schemes for benefiting the race come into merciless contact with the hard, cold realities of life and the struggle for existence, always, at best, a mortifying experience. Friction at this point is inevitable; a reduction to a minimum is all we can hope to effect. Whether the financial relations which we sustain to the laity are the best possible which could be assumed to effect this reduction, is the question to which I wish briefly to call your attention to-day. I stand here simply as an animated interrogation point.

* Read in the Section on Public Health at the Thirty-Seventh Annual Meeting of the American Medical Association.

No doubt the question has suggested itself to many of you that the treatment of this subject would have been much more appropriately undertaken by one of wider experience and longer standing in the profession, but it is the peculiar privilege of youth and inexperience to ask the *raison d'être*, even of truths which we have come to regard as axiomatic and customs which have grown hoary with centuries of observance. Is the system of making a physician's income from a family or community depend solely upon the amount of sickness occurring in it, the best that can be devised for the mutual interests of both parties concerned? Such practically is our system. Its philosophy might be condensed in the motto, "Millions for Cure, but not one cent for Prevention." The astute Chinese, who were discussing civil service reform when our ancestors were building the reed hut and hurling the flint-tipped javelin, are said to pay their medical attendants regularly as long as they enjoy good health, but to promptly discontinue their remittances on the first appearance of sickness, to resume only on recovery; which no doubt has arisen from their absurdly attempting to live up to a foolish old proverb of ours about "an ounce of prevention."

It seems to me that the weakness of our system lies in this one fact, that it gives us such an exceedingly limited opportunity for what has been well called the practice of preventive medicine. No one thinks of consulting us until they at least "feel unwell," and in many instances not until days, or even weeks of precious time have been wasted or worse, in trying to "wear the trouble off," or in blindly applying every crude remedy which household experience, patent quackery, or superstition can suggest; all because they are "not sick enough to call a doctor"—in other words, don't feel uncomfortable enough to be willing to pay more than the price of a bottle of patent medicine for relief. To such an extent has this habit of delaying been carried, that we often find patients hesitating to call us in just because they are unwilling to admit even to themselves that they are "so seriously ill" as to need our services. In fact, the abominable phrase "sick enough to need a doctor" has become almost the popular synonym for, at best, a serious indisposition and often a well-developed stage of a possibly fatal disease. The phrase and the feeling

that it represents ought to be obliterated from the speech and thought of every civilized community. Through its influence we are brought face to face with the legitimate result of months or even years of violation of the laws of our being, aggravated by days of neglect or maltreatment, and confidently expected to avert the vengeance of outraged nature and undo the work of years in days or weeks. "If I had only been called sooner," is a sadly familiar phrase in our professional vocabulary. To thus stem or even reverse the current of nature, we are driven to use the most powerful agents, many of them deadly poisons, to call "halt!" in tones which will compel the attention of the most obstinate morbid process, and every few decades a not wholly unnatural wave of popular indignation sweeps over the community, not against itself for living so as to render such drugs indispensable, but against physicians, forsooth, for prescribing them. It was on the crest of such ever-recurring waves that the Hahnemanian, Thompsonian, botanical, hydropathic, and faith-cure manias successively came into popular favor. Thus the mutual confidence and sympathy which should exist between the profession and the public is seriously impaired, and the interests of both suffer in consequence. Would not a system of constant medical attendance, remunerated alike in sickness and in health, enabling us to give advice or treatment just when we see it is needed, even if unasked, and rendering professional counsel, not only in disease, but in health, the first thought, the easiest and most natural thing, the rule instead of the exception; would not such a scheme as this, if practicable, most happily modify the condition of affairs and prove a long step toward securing the health and happiness of the race?

But supposing ourselves installed in full charge of a case, are we even then freed from the perplexities of our financial system? Scarcely even then. How often are we annoyed in the very midst of a serious case, when every shadow of change must be instantly noted and promptly met, by the remark of the family, friends, or even of the patient, that they "can't afford to have us come so often." This, fortunately, is not a very common experience, but all of us can testify that when it does occur it is, to say the least, exceedingly disheartening. When, however, we reach the period of convalescence, another

head of the hydra springs up to confront us : " Really, doctor, I feel so much better this morning that I don't think you need call again until I send for you," is the remark of our wan-lipped and languid patient, blissfully ignorant of the hundred and one pitfalls which yet lie between him and health, and we can but submit to his decision or run the risk of being thought anxious to make all we can out of the case, and possibly of having our bill for subsequent services protested. How often are we called in hot haste only to find our patient beyond help, or if we escape this, how frequently does the convalescent, dissatisfied with the slow and uncertain progress he is making, conclude with charming consistency that it is the fault of our treatment, " too much strong medicine," perhaps, and resort to some rival physician, quack, or vender of patent medicines, to whom he ascribes all the credit of the cure ! These results are patent to the most unskilled eye ; but what a prophecy of evil to come can be read in living letters by the eye of the trained observer in the history of many of these half-cured cases, even when their course and termination may have been perfectly satisfactory to the unsuspecting patient and his friends ! How many of our most serious and most obstinate chronic troubles spring directly from the half-removed result of some acute attack ! How often are the germs of evils which will curse generations yet unborn, left lurking in the system, simply because the subject thinks himself cured and doesn't want to make his bill any larger ! Of course much of this too-early cessation of treatment is due to a simple aversion to taking any kind of trouble unless spurred on by pain or fear ; but would not this tendency be greatly checked by a knowledge on the patient's part that his bill at the end of the year would be just the same whether he took further treatment or not, while other advice or new remedies would be an additional expense ; as would be the case under a system of constant attendance ?

What influence does our present system of attendance give us over the sanitary surroundings, diet, or habits of life of our patients ? Almost none. It is true we have the priceless privilege of giving any amount of excellent advice on these subjects, which they may perhaps remember for a week, though usually they regard it simply as a customary and harm-

less prelude to the prescription, which they regard as the "value received" for their fee. Such an effect has the proportioning of our remuneration to the number of distinct, definite services rendered had upon the ideas of the laity, that many of them have no idea of paying for anything except some such tangible benefit as a prescription or an operation. In some instances we are actually obliged to give a prescription in order to secure the right (in their minds) to claim a fee. They will pay a dollar for a prescription and get the advice thrown in for nothing, and as the immortal "Josh Billings" has sagely remarked, "what people gets for nothing they are mighty apt to value at about what they gave for it." Over the home life of our patients we have almost no control, or even supervision, until after the mischief (which often might have been averted by a few timely precautions) has been done, and even that ceases almost as soon as we began to exercise it. What sort of success would we expect from a nurseryman who was not permitted to prune his trees until they were already misshapen, to destroy their infesting parasites until the foliage was withered, who was not allowed to water them till they began to droop, or manure them till they were almost exhausted? And yet this is the relation to the bodies of our patients in which we are practically placed by our present system. The words "cobbler and tinker" are terms of reproach, and yet cobbling and tinkering is about all we are permitted to do to the vital mechanisms of most of our patrons.

When we consider this fact in the light of the deliberate statement of Mr. Chadwick, the distinguished English sanitarian, that he can build a city which shall have any required death rate from 3 per 1000 up; when we remember that "the white plague of the North," as Holmes aptly calls consumption, which is responsible for the lion's share of our death rate, is more than analogous to the familiar spindling of plants deprived of air and sunlight; that as much as fifty years ago even a layman like Lord Palmerston declared that "for every death from typhoid somebody ought to hang;" that an unfailing specific for malaria, diphtheria, and cholera is contained in a six-inch drain-tile—in short, that nearly one half of our existing diseases are absolutely preventable, does not a readjustment of our relation to the public appear urgently

necessary? How would a system of constant attendance at a fixed sum per year or month, including an annual or semi-annual sanitary inspection of the residence and surroundings, and review of the diet and habits of life of the family, if practicable, modify the conditions under which we are now attempting to promote the health of the public? I am well aware that this system at present is generally stigmatized by us as a "quack method," if not a form of quackery itself; but I think even the bad hands into which it has to some extent fallen should not prevent our candidly recognizing and, if worthy, appropriating any feature of value which it may possess. Besides, we must remember that the system, in part at least, is in practical operation in the different lodges and benefit associations, in manufacturing establishments and mines all over the country, with generally eminently satisfactory results regarded from an economic standpoint. Of course the principle upon which all these plans are adopted is a purely economical one, to get the greatest amount of service for the least possible cost; and they could only be expected to be a success in this direction.

The plan which I would respectfully submit is much wider in its scope, and is briefly as follows: That at the beginning of the calendar year each individual or family should engage his or their medical attendant for the next twelve months, agreeing to pay him a specified annual salary in advance, either in full or in quarterly or monthly instalments. The physician on his part should agree to render any and all professional services required, except operations or manipulations requiring the skill and training of a specialist, for the annual consideration specified, which might readily be fixed according to some rate *per capita* or *per familiam* laid down in the fee bill. The physician should further agree, in consideration of the sum specified, to make an annual or semi-annual inspection of the sanitary condition of the house and premises of his client, and to offer such suggestions as he saw fit in regard to the diet or habits of life of himself or his family—in short, to act as general adviser on all matters of hygiene or therapeutics. The system might briefly and, perhaps, not inaptly be described as a scheme of "health insurance." What are the advantages which seem to be presented by this plan? In the

first place, our patients would have no inducement whatever to delay consulting us; in fact, moved by a not unnatural desire to get their money's worth out of us, would probably hasten to do so at the earliest appearance of discomfort or danger, and thus give us full control of the case at that period in which a "stitch" properly taken often saves, not "nine," but "ninety and nine." We should have every opportunity to abate or favorably modify the attack, and it needs no word from me to point out to you the well-nigh inestimable value of this vantage-ground. Later during the progress of the case there would be not the slightest danger of any objection to the frequency of our visits; on the contrary, the difficulty would lie in exactly the opposite direction, and would constitute the principal drawback of the system. In convalescence, we need fear no interruption to those finishing touches which may exercise such a powerful influence upon the future comfort or safety of our patient, and in the giving of which the master hand finds scope for the finest and most highly appreciated subtleties of its skill.

Above all, it would give us a fair opportunity for the practice of the grand branch of preventive medicine, a privilege which under the present system is practically denied to us. How is it that until within the last few years in scarce even in one of our many and justly famous professional schools and colleges, was there to be found a full professor of hygiene or a chair of preventive medicine? Why is it that one could almost count upon his five fingers all the really valuable and exhaustive treatises upon this subject by American authors? Where are the Grosses, the Bartholows, the Flints, the Emmets of hygiene, or the Agnews, the Hammonds, the Knapps, and the Roosas of preventive medicine? The profession of the United States has yet to produce the man who has won a national reputation solely by his work or writings in this department. One reason at least for this state of affairs is not far to seek; the field for work in this direction has been either so exceedingly limited or so barren and difficult of cultivation as to almost deprive us of any inducement to develop it. Skill and proficiency in any other branch of our art are highly appreciated and well remunerated, but in this one they are regarded with the utmost indifference. As

medical students we are required to practically acquaint ourselves with, say, seven branches in a comparatively short space of time, knowing that the public are quite willing to pay us for proficiency in six branches out of the seven, but will hardly even accept our advice gratis in the seventh; and the result is well-nigh inevitable. How can we expect it to be otherwise when the student has absolutely no prospect of a fair remuneration for the time and labor expended in obtaining a thorough knowledge of this branch, unless he chooses to enter the uncertain arena of politics as a candidate for the often poorly paid and unpopular position of a health officer? In spite of this utter lack of pecuniary or even honorary inducement, in the face of sneers at his "pretended" zeal, to his everlasting credit be it spoken, the American physician is to-day the truest promoter of the health of the people, the most earnest and, I had almost said, the only persistent advocate of sanitary measures; but would not the "health insurance" system, if generally adopted, give a new dignity to his labors and immensely increase the scope of his energies?

Would not this system also do much to break up that unfortunate mental habit impressed upon us from earliest infancy, which involuntarily connects the doctor with discomfort and bitter medicine, if not with the undertaker and the sexton?—a habit whose influence upon the popularity of the profession, though slight, is sometimes unpleasantly appreciable. It would also tend to lessen the present unfortunately too common tendency to select professional advisers on the spur of the moment, or dismiss them from some momentary impulse of dissatisfaction, a course highly prejudicial to the interests of both parties. Most men give less careful, deliberate consideration to the choice or dismissal of their family physician than they would to the consummation of a horse-trade. The financial advantages of the scheme in rendering our incomes, not only more definite, but also more certain, are obvious, and the few figures bearing upon the subject which I have been able to collect, which I dare hardly dignify by the name of statistics, render it at least highly probable that a rate *per annum* can be fixed which would be both satisfactory to the public and remunerative to us. The agreement would simply be an ordinary, common-sense business arrange-

ment, legally binding, so that there could be no possible objection on the part of our clients to being reminded of their delinquencies by a collector or any dissatisfaction with the size of the bill. Each "policy-holder" would know in advance the exact amount of his "premium" and the date at which it would be due, and could prepare to meet it promptly like any other business obligation, instead of, as now, neither knowing the amount nor the date till after it is due, and regarding the obligation as a part of an inscrutable dispensation of Providence, which he will try to meet when he can conveniently spare the money.

Now, just a word on the drawbacks of the scheme, though it is probably a subject which might safely be left to those who are to follow me. No doubt the objection which is already uppermost in the minds of most of you is the enormous and unreasonable demands on our time which would be made by some of our patients under this system. In addition to the insane craving of some persons for constant medical attendance, there will be added the not wholly unnatural desire to "get their money's worth" out of us; but would we not be, in some respects, in a better position to meet these demands than at present? In the first place, when entering upon the agreement we should give our patients to clearly understand that they were engaging us, not to be simply medicine-carriers or visit-makers, but to advise them to the very best of our judgment, and that the question of the necessity of the visit must be left largely to our discretion. Then the tenure of our professional position being so much more secure, we shall be able to treat these unreasonable cases on a much more rational basis. We could safely reason with them, if necessary reprove or scold them, or even occasionally afford to tell them the truth. We might occasionally find ourselves in a position to make use of Abernethy's celebrated prescription, given to a gentleman who somewhat pompously introduced himself as "James Peet, of Rock Villa, Clonmel, Waterford, Ireland." It was not committed to writing, but was delivered verbally somewhat as follows: "James Peet, of Rock Villa, Clonmel, Waterford, Ireland, go back to Rock Villa, Clonmel, Waterford, Ireland, and fancy you are well, and you will be well." If these means should fail us, there

are a hundred and one rusty weapons in our armamentarium, such as blisters, nauseous draughts, venesections, or hypodermic injections of *aqua destillata*, which could be used with deadly effect.

But perhaps the most practical objection would be based on the probable unwillingness of the laity to pay any sum in advance for services which they are not even sure that they are going to need ; but even this objection loses some of its force when we consider the almost innumerable number of lodges, guilds, and benefit associations into which not only the educated, but even the most unintelligent classes are forming themselves for just this kind of mutual protection. When we further consider that scarcely fifty years ago life insurance was regarded as not only absurd and impracticable, but even impious, while now men of every condition are willingly paying from $10 to $1000 a year solely for life insurance, it would scarcely seem improbable that their education up to the point of paying the comparatively trifling sum necessary for "health insurance" would simply be a matter of months or years.

Of course the annual fee would necessarily have an important effect on the weight of this objection. This can only be determined by past experience. Simply as a rough estimate of the probable amount of this fee, I would refer to a few fragmentary statistics which I have been able to collect. These statistics have been taken from four different ledgers, one of which was kept in a country village of about 1200 inhabitants, another in a town of about 6000 inhabitants, and the other two a city of 35,000 population, thus embracing nearly all classes of practice. The results even from so small a number of data are comparatively uniform. The village series comprises only 27 families, or about 130 persons, who spent the exceedingly low sum of $7 per annum for medical attendance. The town statistics, covering nearly 400 families, show an average of about $13.50 per annum, while the city series, embracing 150 families, or nearly 700 persons, show an average expense of over $19.* From these it would appear to be probable that the average expense per annum, making the necessary allowances for healthfulness of location and

* These statistics cover an average of about three years.

habits of life, would approximate very closely to $13 per annum, or a little over $1 per month, the actual average from the inclosed figures being $13.60. When we consider the really appreciable preventive influence which we might exercise, I think we would almost be justified in concluding that we could afford to render the proposed services for the present average expense, or perhaps even for less, especially when we remember the greatly increased certainty of our being paid; and when we can represent to our clients that all these invaluable hygienic advantages may be secured in addition to regular attendance, at the cost of the latter, surely a reasonable man need have no hesitation about adopting the system. Surely we could afford to perform the same services under more favorable circumstances for the same sum. The sum proposed very closely approximates to that contributed by miners for similar purposes, the assessments ranging from 75 cents a month for a single man, to $1.25 to $1.50 a month for a married man, according to the size of his family. Probably a fair average under our system would be for adults $5 and children $1.25 *per capita* per annum, which would impose almost exactly the average expense per annum on an average family of five members. Taking these scattered figures as an indication, it would hardly appear probable that any serious objection will be raised by the laity on account of expense.

Without doubt the objections to the plan are neither few nor groundless; but are not the advantages proposed to be secured both real and valuable? In fact, it seems to me that the time has already come when an effort must be made to secure them. The crying need of the age is for sound hygienic teaching, and if the profession fail to give it, who can fill their place? I care not what means be adopted to reach the end, but it must be reached, and to provoke a discussion of ways and means is the sole object of these informal suggestions.—*Journal of the American Medical Association.*

HEALTH OF THE U. S. ARMY FOR AUGUST, 1886.

DURING the month of August, in eight military departments, embracing 143 military posts and arsenals and 31 commands operating in the field, from which reports were received, there

was returned a total mean strength of 23,269 officers and enlisted men.

There were admitted to sick report 2790 cases of disease and injury, or 120 per 1000 of mean strength.*

This is a decrease of 5 per 1000 below that for August, 1885, and 22 per 1000 below the average monthly rate for the ten years (ending December 31st, 1884), which was 142 per 1000 of strength.

Twenty-two deaths occurred, as against 20 for the previous month, and 21 for the previous August. This represents an annual mortality from all causes of 11.3 per 1000, or 1.4 per 1000 less than the average for the preceding decade, which was 12.7 per 1000 of strength.

The number of discharges for disability was 52,† representing an annual loss to the army from this cause of 27 per 1000 of strength.

The number of troops constantly non-effective from sickness was 951, or 41 per 1000 of strength ; being 2 per 1000 greater than for last month. The rate for the previous August was, also, 41 per 1000, and for the previous decade 44 per 1000 of strength.

The rate of recoveries to the whole number under treatment was 727 per 1000 ; the rate of deaths, 5.9 per 1000.

The average duration of treatment among patients who recovered was 9 days, and among those who died 17 days.

The causes of death were returned as follows : Enteric-fever, 3 ; remittent-fever, 1 ; diabetes mellitus, 1 ; pulmonary phthisis, 1 ; pleuritis, 1 ; apoplexy, 1 ; acute congestion of brain, 1 ; cerebral meningitis, 1 ; screw-worms, with ozæna, 1 ; nervous shock from injury, 1 ; burning (accidental), 1 ; crushing (by fall of building during tornado), 1 ; drowning (accidental), 5 ; shot wounds (accidentally self-inflicted), 1 ; homicide, 1 ; and 1 from hemorrhage of the bowels, caused by accidental ingestion of a broken clinical thermometer bulb.

The causes of admission, and those which have chiefly served to impair the health of the army during the month of August, are shown in Table I.

* The names and diseases of all officers and enlisted men who are excused from any part of their military duty by reason of disability are required to be entered upon the reports from which these data are drawn.

† Recruits at depots, discharged for disability which existed prior to enlistment, not included.

TABLE I.

Causes of admission in the order of their numerical importance.	Number of cases.	Rate per 1,000 for August, 1886.	Average rate per 1,000 for ten previous Augusts.	Increase or decrease of rate.
First.				
Diarrhœal diseases	644	27.68	33.94	— 6.26
Diarrhœa	577	24.80	29.79	— 4.99
Dysentery	37	1.59	2.83	— 1.24
Cholera-morbus	30	1.29	1.32	— .03
Second.				
Injuries and accidents	445	19.12	18.08	+ 1.04
Contusions and Sprains	239	10.27	11.91	— 1.64
Incised, punctured, lacerated and contused wounds	101	4.34	3.47	+ .87
Fractures (not shot)	11	.47	.48	— .01
Shot wounds	11	.47	.81	— .34
All other injuries	83	3.57	1.41	+ 2.16
Third.				
Malarial-fever and resulting conditions	340	14.61	27.11	—12.50
Fourth.				
Diseases of the digestive system.	289	12.42	?	?
Constipation, dyspepsia, and colic	150	6.45	10.54	— 4.09
Tonsillitis, pharyngitis, and sore throat	40	1.72	?	?
Other diseases of this class	99	4.25	?	?
Fifth.				
Diseases of the nervous system	160	6.88	10.60	— 3.72
Headache and neuralgia	141	6.06	9.39	— 3.33
Other diseases of this class	19	.82	1.21	— .39
Sixth.				
Rheumatism	144	6.19	8.04	— 1.85
Seventh.				
Venereal diseases	143	6.14	?	?
Gonorrhœa and results	64	2.75	3.93	— 1.18
Syphilis and results	42	1.80	3.96	— 2.16
Other venereal diseases	37	1.59	?	?
Eighth.				
Diseases of the respiratory system	115	4.95	8.58	— 3.63
Catarrh	57	2.45	4.95	— 2.50
Bronchitis	40	1.72	2.25	— .53
Pulmonary phthisis	3	.13	.31	— .18
Pleuritis	2	.09	.37	— .28
Pneumonia	2	.09	.19	— .10
Other diseases of this class	11	.47	.51	— .04
Ninth.				
Enteric-fever	18	.77	.68	— .09
Tenth.				
Typho-malarial-fever	5	.21	.47	— .26

Among the more important diseases under treatment during the month of August—those remaining sick from the previous month being included—were 34 cases of enteric-fever, 18 new cases being reported ; 5 cases of typho-malarial-fever, all admitted this month ; 8 cases of pneumonia, 2 of which were new admissions, and 17 cases of pulmonary phthisis, 3 of which were newly admitted.

There was an increase of 12 cases of enteric-fever, and a decrease of 3 cases of pneumonia and of 3 cases of pulmonary phthisis, from the whole number under treatment in July.

The ratio of mortality from enteric-fever to cases treated was 8.8 per cent ; typho-malarial-fever, 0 ; pneumonia, 0 ; and from pulmonary phthisis, 5.9 per cent.

Of contagious and infectious diseases there were reported 3 cases of measles, 2 of erysipelas, and 1 of mumps.

A comparison of the health of the several military departments is given in Table II.

TABLE II.

	Admission rate per 1,000 of mean strength.	Number of troops per 1,000 of mean strength constantly non-effective from sickness.	Average number of days treated among patients who recovered.	Rate per 1,000 of deaths to number of cases treated.
Department of :				
Texas	149	60	11	7.4
Dakota	137	42	7	3.1
East	132	43	8	6.0
Platte	126	39	8	6.7
Missouri	124	42	9	11.2
Arizona	93	36	10	3.7
Columbia	90	29	13	
California	2	25	11	11.1
The entire army for the month	120	41	9	5.9
The entire army for the preceding decade, monthly average	142	44	?	7.5

Thirty-four posts have shown for the month admission rates which were greater than the normal of 142 per 1000 of mean strength, and 109 less.

In the Department of Texas 38 per cent of the posts gave admission rates above the normal. In the Department of the Platte, 31 per cent; in the Department of Arizona, 30 per cent; in the Department of Dakota, 24 per cent; in the Department of the East, 22 per cent; in the Department of the Missouri, 20 per cent; and in that of California, 8 per cent. None of those in the Department of the Columbia had rates of admission that were above the normal.

The posts showing the highest rates per 1000 of mean strength were: Fort Missoula, M. T., 327; Fort Davis, Tex., 309; Little Rock Barracks, Ark., 259; Fort Lowell, A. T., 257; Jefferson Barracks, Mo., 243; Fort Omaha, Neb., 231; St. Francis Barracks, St. Augustine, Fla., 227; Fort Preble, Me., 216; and Washington Barracks, D. C., 214. The lowest admission rates were: Fort Gaston, Cal., 0; Fort Mason, Cal., 0; Whipple Barracks, A. T., 9; Fort Mackinac, Mich., 14; and Fort Bowie, A. T., 18 per 1000 of mean strength.

Forty-one posts have shown rates of constant non-effectiveness from sickness above the normal of 44 per 1000 of mean strength, and 98 less.

In the Department of Texas 54 per cent of the posts furnished rates of constant non-effectiveness from sickness above the normal. In that of the Platte, 38 per cent; of Dakota, 33 per cent; of the East, 32 per cent; of Arizona, 25 per cent; of the Missouri, 20 per cent; of California, 8 per cent; and in the Department of the Columbia, 0 per cent.

The posts showing the highest constant rates were Fort Davis, Tex., 138; Little Rock Barracks, Ark., 97; Indianapolis Arsenal, Ind., 97; Fort Lowell, A. T., 95; Jefferson Barracks, Mo., 92; Fort Robinson, Neb., 86; Fort Brown, Tex., 85; Fort Concho, Tex., 84; and Fort Huachuca, A. T., 82 per 1000 of strength; while the lowest were: Fort Mason, Cal., 0; Fort Sisseton, D. T., 3; Watervliet Arsenal, N. Y., 5; Fort Gaston, Cal., 6; Fort A. Lincoln, D. T., 8; Fort Ellis, M. T., 10; Fort Mc Dermit, Nev., 10; Fort Mackinac, Mich., 10; Fort Elliott, Tex., 11; Fort Totten, D. T., 11; Fort Bowie, A. T., 11; Fort Hamilton, N. Y., 12, and Fort Trumbull, Conn., 13 per 1000 of mean strength.

At stations reporting high admission rates malarial-fever,

diarrhœal and venereal disorders, together with diseases of the nervous system, and injuries have prevailed.

The causes producing high constant rates: malarial-fever and diarrhœal diseases, together with cases of consumption, pneumonia, enteric-fever, heart disease, and rheumatic-fever.

During the month of July enteric-fever existed at fourteen stations, as follows: at Fort Davis, Tex., 7 cases; Fort Assiniboine, M. T., Fort Huachuca, A. T., and West Point, N. Y., each 4 cases; Fort Riley, Kan., 3 cases; Fort Monroe, Va., Fort Randall, D. T., and Fort Douglas, U. T., each 2 cases; and at the following: Fort Wayne, Mich., Fort Reno, I. T., Fort Sill, I. T., Fort Lowell, A. T., Fort Bayard, N. M., and Fort Niobrara, Neb., each 1 case. Of the above cases those at Fort Davis, Tex., included 5 new admissions; at Forts Assiniboine, Riley, and Randall, each 2 new cases, and at the following, Fort Reno, Fort Sill, Fort Lowell, Fort Douglas, Fort Bayard, Fort Huachuca, and Fort Monroe, each had 1 case admitted to sick report during the month.

Three deaths occurred from this disease, 1 at Fort Douglas, U. T., 1 at Fort Niobrara, Neb., and the other at Fort Riley, Kan. These fatal cases had an average treatment of 17 days.

Pneumonia existed at seven stations, as against ten for July, and nine for June. The cases newly admitted occurred at Fort Davis, Tex., and Watertown Arsenal, Mass., 1 each. Those reported from the other stations were cases remaining from previous month.

Measles were reported at Willet's Point, N. Y., Fort Hays, Kan., and Fort Grant, A. T., each 1 case.

Erysipelas, 1 case, at Fort Warren, Mass., and another at Fort Brown, Tex.

Mumps, 1 case, at Willet's Point, N. Y.

The post surgeon at Fort Davis, Tex., forwards a report of the sanitary condition of the post for the month, of which the following is an extract:

"During the month several cases of typhoid-fever have occurred, the original case having been transferred from Fort Stockton, Tex., and some other cases being recruits from Jefferson Barracks, Mo.

"There has been a large increase in the cases of intermittent-fever, due in my opinion to the very moist and hot weather,

the cases from two companies alone numbering 25, one of these companies but lately arrived at this post from Fort Hancock, Tex., and the other from Camp Pona Colorado, Tex., which will likely account for the large amount of sickness among them, as they are not yet acclimated."

The post surgeon at Fort Grant, A. T., under date of August 10th, 1886, reports that a recruit for the Ninth Infantry, *en route* from Columbus Barrack, O., to Fort Thomas, A. T., was admitted to that hospital (Fort Grant) with the measles shortly after arriving at that post on August 9th.

Reports received from 31 commands operating in the field showed an aggregate mean strength of 1497 officers and enlisted men.*

One hundred and six cases, or 71 per 1000 of mean strength, were admitted to sick report during the month, of which number thirteen were transferred to permanent stations for treatment, and appear upon their returns.†

Of these admissions 94, or 89 per cent, were for disease, and 12, or 11 per cent, for injuries.

Sixteen commands were operating, or were *en route*, in the Department of Arizona, their strength, averaged for the month, aggregating 975 officers and enlisted men, with 62 cases of disease and injury, or 64 per 1000. Five commands in the Department of the Platte, representing a total mean strength of 211, with 14 cases of disease and injury, or 66 per 1000.

In the department of the Columbia there were 4 commands, aggregating 115 officers and enlisted men, with 4 admissions to sick report, or 35 per 1000; in the Department of Dakota 3 commands, aggregating 23 officers and enlisted men, with 9 admissions to sick report, or 391 per 1000. The Department of the Missouri had 2 commands, representing an average strength of 95 officers and enlisted men, with 10 admissions to sick report, or 105 per 1000. The Department of Texas had 1 command, with a total mean strength of 78, and 7 admis-

* There were other commands in the field to which no medical officers were attached, and from which this office received no reports.

† To avoid duplication, these cases are dropped in the final consolidation for the entire army.

sions to sick report, or 90 per 1000. The Departments of the East and California had no field commands.

The prevalent disorders among troops in the field were malarial-fevers and diarrhœal diseases.

Attached to the army, and living at the different military stations, were 4998 women and 6089 children, the wives, children, and servants of the officers and enlisted men.

Among the women were reported 445 cases of sickness during the month, or 89 per 1000 living. One death occurred, representing an annual death rate of 2.4 per 1000 living. The cause of death was dysentery.

Among the children 407 cases, or 67 per 1000, were taken sick. Sixteen deaths occurred (15 of which were of those under five years of age), representing an annual death rate, at all ages, of 31.5 per 1000. The causes of death were reported as follows: Entero-colitis, 4; cholera-infantum, 4; dysentery, 2; convulsions, 2; gastro-enteritis, 1; chronic meningitis, 1; valvular disease of heart, 1; bite of rattlesnake, 1.

Very few cases of contagious and infectious diseases occurred during the month.

At Willet's Point, N. Y., 1 case of measles and 1 of mumps was reported; 1 of measles, at Fort McHenry, Md., and 1 of erysipelas, at Augusta Arsenal, Ga.

Diarrhœal diseases have extensively prevailed, while malarial-fever and diseases of the digestive system may be mentioned next in order of prevalence.

VEGETARIAN SOUP.—The following is the recipe of the soup used in the "vegetarian penny dinners" established at Gateshead-upon-Tyne last winter. *To make one gallon:* Take half a pound of whole wheat and half a pound of lentils, and boil furiously for two hours. Then add one pound of potatoes (mashed), one pound of mixed vegetables—*e.g.*, turnips, parsnips, carrots, onions, etc.—and half a pound of mixed fruit (apples, plums, etc.).

The potatoes should be first boiled in their skins and then mashed; the vegetables and fruit should be chopped small or grated. Boil for another hour and stir well. Flavor to taste with butter, sweet herbs, and spices.—A. F. HILLS, *in Sanitary Record.*

EXISTING METHODS OF SEWAGE AND HOUSE REFUSE DISPOSAL IN TOWNS.*

By Alfred Hill, M.D., F.I.C., Medical Officer of Health for Birmingham.

In taking possession of the presidential chair it becomes my duty to express to you my sense of the honor you have done me in unanimously appointing me your president for the official year which we enter upon to-day, and my cordial thanks to you for making me its little-deserving recipient. It is an honor which, until the eve of the election, when the matter was unofficially mentioned to me, I had never for a moment anticipated or presumed to expect, and on that account my appreciation of your kindness is all the more sincere and complete. The graciousness of the selection is increased by the fact of its object being an extra-metropolitan member of the Society, and the first of that section of its members who has been called to the chair. Having thanked you on my own account, individually, I trust I shall not be considered presumptuous, or in any way out of place, in thanking you on behalf of the provincial members generally; I feel sure they will regard, with me, the election of one of their number as a compliment paid and a privilege extended to themselves, and that it will act as an incentive to them, in whatever part of the kingdom they may reside, to take an increased interest in the Society and a more active participation in its proceedings. I believe, further, that it will have the effect of attracting many new members to the Society, and so of increasing its influence and extending its usefulness.

Of the various able and valuable presidential addresses which have already been delivered from this chair, I believe none have dealt with the question of the disposal of house-refuse and sewage. Bearing in mind its many-sided character, the general difficulties which attend it, its economical aspects,

* Inaugural Address delivered to the Society of Medical Officers of Health, Session 1886–87, October, 1886.

and, above all, its influence on health, I trust that my selection of the subject may not be considered either inappropriate or unprofitable. Another claim to a comparison of the various methods of disposal is established by the fact that, in the minds of many medical officers of health and engineers, no definite conclusions have yet been arrived at as to which mode is the preferable one. Considering how many years the question has been on the *tapis*, and how varied and extensive by this time is the experience with regard to it in this and other countries, I cannot help thinking that it is time that medical officers of health and engineers, who are often called upon to advise on the matter, should be in a position to give a decided opinion upon it when appealed to, and, if necessary, a "reason for the faith that is in them." This can only be done by a comparison of all the methods and a consideration of the surrounding circumstances. It is this comparison and this consideration which I propose to undertake.

Under the term sewage disposal is to be included the disposal of excreta, whether admitted into the sewers or intercepted from them by any of the usual arrangements.

Leaving out of consideration for the present the mode of disposal prescribed by the Mosaic law for the Jews, as not coming within the scope of the present object, owing to the very different conditions under which they lived, we may refer at once to the old-fashioned midden-privy, until late years the most usual receptacle in most towns of excrementitious and often other effete and refuse matters and slops—a combination, in fact, of a cesspit, an ashpit, and a midden-heap. Such a mixture of fæcal matter, urine, and slops, with animal and vegetable house refuse, may properly be regarded, although mixed with a certain amount of ashes, cinders, and coal, as of the nature of sewage, especially when it is considered that much of it is in the liquid form, and actually finds its way sooner or later to the sewers by means of the drains with which such midden-pits are furnished, or, in the absence of drains, by the less desirable and more circuitous means of leakage and overflow. The pit is unnecessarily deep and large, it is open to the rain, it is not water-tight, sometimes not drained, or, if drained, the outlet becomes obstructed, a volume of liquid filth, stagnant and horribly offensive from

decomposition, accumulates, poisoning the air for a considerable distance, while soakage goes on into the ground, polluting it to an extraordinary degree, and finding its way to the surface wells, from which the tenants draw their domestic water supply. It is well known that well waters in such situations are always very impure. The pollution is not, however, limited to air, soil, and water, but, owing to the improper situation of the pit, the interiors of houses are invaded by the liquid contents. They are sometimes so near to the dwelling that the stench from them is continually perceptible inside, while in still worse cases the house wall forms one or more of the sides of the pit, so that its contents are in actual contact with such wall, making it damp with the most disgusting liquid filth, and diffusing gaseous impurities into the rooms, the liquid itself in some instances finding its way through the joints of the brickwork into the basement or cellar, and sometimes into rooms on the ground level.

Where, as is not unfrequently the case, workshops, with a view to economize space, are situated over these ashpits, the effluvia rises through the ceiling, which is often defective, or, which is not uncommon, between the boards of the floor, which alone separate the shop from the space below. It need hardly be said that the air of such shops is impure and offensive, and renders them totally unsuited for occupation.

The list of evils attaching to the midden-privy is not, however, quite complete, for, although the contents may not require to be distributed for a long time—it may be months, in some exceptional cases years, according to the nature of the ground, whether it be impervious, like clay, or highly porous, like chalk or gravel—the time at length arrives for emptying it. The horrible nuisance produced by the disturbance and removal of such a mass of putrid, reeking filth is hardly to be imagined, for it is conveyed in wheelbarrows, sometimes of necessity through the house, and tipped upon the surface of the street, from which it is shovelled into carts to be conveyed through the town to the depot, a portion often being spilled on the line of street traversed, and allowing the carts to be traced along the whole route. The surface of the street on which the contents were temporarily deposited absorbs a considerable quantity of liquid filth, which for a day or two, par-

ticularly in hot weather, emits effluvia of the most offensive kind. But, besides being offensive, the removal of such material is attended with danger to health, no doubt more or less in all cases, but especially where it is specifically infected. A striking illustration of the danger of infection by this means came under my observation in the year 1873, when small-pox was epidemic in Birmingham: in the first quarter of that year five of the night-soil men, who had been engaged in emptying ashpit-privies connected with houses where small-pox existed, were attacked with the disease, with the result that three of the five died.

I have already referred to the large size of these midden-ashpits. It has been computed that the average area each presents in the borough of Birmingham is about 30 square feet, with a depth of 5 feet 6 inches, 3 feet below and 2½ feet above the surface of the ground. In 1871 it was found that the total number of middens in Birmingham was 19,551; "it would thus appear," to quote the words of the Sewage Enquiry Committee, "that the area occupied by these offensive receptacles is 65,170 square yards, or about 13½ acres."

From these data some conception can be formed of the enormous relative area and volume of this mass of filth, and of the effect it is likely to have on the public health.

The great evils of the midden-privy having become officially as well as generally recognized, a movement was made a few years ago for its abolition, and the substitution for it of some system or systems which should be free at least from its most glaring defects.

As in some towns a water-carriage system was either impossible or difficult, or was regarded with disfavor, some other form of interception was looked for. A considerable number of plans were proposed, the principal feature in all of which was that they should prevent contamination of the ground and reduce to a very large extent the vitiation of the air. The one involving the smallest departure from the old system was that adopted some years ago in Manchester, in which the old-fashioned huge midden-pit was replaced by what may be called, for the sake of distinction, a midden-closet, a small shallow pit situated entirely under the privy-seat, which by means of hinges admitted of being raised, so that the ashes

from the house could be daily thrown upon the excrementitious matter to absorb the liquid and gaseous portions of it. The shallow-dished floor of the pits is made of waterproof material, thus preventing soakage into the soil, a ventilating flue is carried from the cavity under the seat to the roof of the house to which it belongs, and the little pits are emptied once a week or fortnight. Subsequently movable receptacles either of wood or metal were substituted for the fixed ones, and these are removed weekly to a central depot, where their contents are mixed and prepared for manure. This ashpail or pan system has been in operation for some time at Nottingham, and has attained to a very considerable development. It is spoken of in decidedly favorable terms by Dr. Whitelegge, the Medical Officer of Health, in comparison, I presume, with the old midden-privy, over which it certainly possesses many advantages ; for instance, the receptacles, being small, they must necessarily be frequently emptied—once a week, or oftener, thus avoiding the large accumulations and long retention which are so objectionable. They are above instead of in the ground ; they obviate, when in good order, pollution of the soil, and from their situation under cover they receive no rain, their greater dryness protecting their contents from rapid putrefactive change.

If, instead of ashes being used as the absorbent, dried earth be employed, we have what is called the earth-closet ; it has the *primâ facie* recommendation of being based on Nature's own method of deodorization, and the principle is no doubt absolutely perfect. The application of the principle, however, is quite a different matter. It is one thing to take the excrement to the soil, but it is a totally different one to bring the soil to the excrement.

The Mosaic law enjoined the former.

This law for the Jews was only an imitation of the practice of some animals. The dog and the cat are in the habit of scratching the soil over their dejections, and the latter of ascertaining by the sense of smell whether deodorization be complete or not, and if not of scattering over them more soil. It would, however, be manifestly impossible to employ earth for the deodorization of excrement in large towns ; it may answer very well in detached houses with gardens, for institu-

tions in the country, or even for villages, but for larger populations it can be proved at once that the plan is not feasible. It has been shown by experiment that 4½ lbs. of earth per head per day is required for the purpose, so that for a town having a population of 100,000 persons over 200 tons of earth would be required every day. This earth must be of the right kind, viz., more or less of an argillaceous character, as chalk is found to be much less efficient, while sand is of very little value. It must be sifted and dried, brought from the country into the town and taken back, preserved from damp, and thrown upon each dejection at once and in proper quantity. These proceedings would involve such an amount of labor, expense, and care as place the method entirely beyond the range of practical application, while the mixed soil and excrement are found to possess only a small manurial value. Earth-closets, moreover, are not safe inside houses, owing to the impossibility at all times of ensuring complete deodorization.

A remarkable instance at once of the deodorizing and purifying power of earth and of the survival of an ancient custom is presented by the Greek gypsies now encamped near Hull. I am informed, on good authority, that though latrines have been provided at the camp, these people prefer to practise a method similar to that of the Jews of old under the Mosaic dispensation as laid down in Deuteronomy 23 : 13 : "And thou shalt have a paddle upon thy weapon ; and it shall be when thou wilt ease thyself abroad thou shalt dig therewith and shalt turn back and cover that which cometh from thee." This plan is no doubt well adapted for a nomadic people, leading a primitive camp life, and to such alone.

The "Goux" system is a modified form of the earth-closet system, but it is doubtful whether it is an improvement upon it. Instead of using dry earth and throwing it in after each use of the closet, a mixture is employed consisting of shoddy, sawdust, ashes, street-sweepings, and other dry and absorbent substances, which can be readily and cheaply obtained, and the tub is lined with it by placing a portion at the bottom, and upon this a central, nearly cylindrical, core or mould, between which and the sides of the tub the absorbent powder is tightly packed. On removing the cylinder the absorbent

material retains its position as an encircling wall, having a thickness of 2½ inches. The only town that I am aware of in which it has been extensively tried is Halifax; but I am informed that it is by no means a success, either in the working or in the financial sense, though in a sanitary point of view it is said to have proved of much service, diminishing in a marked degree the general death-rate, and particularly the death-rate from fever. Such a result is not surprising when the system is compared with the filthy ashpit-midden system, which it partially supplanted.

Earth-closets and similar devices are admissible in theory, but they have the serious disadvantage of utterly breaking down in practice unless their use be very judiciously restricted, and carried on under such conditions as are entirely out of the question in connection with the class of people forming the great bulk of our town populations. They have a limited application, no doubt; but for general use the idea of their adoption cannot be entertained.

Among the difficulties stand prominently that of obtaining suitable material and the cost of its preparation and transport. It must be evident at a glance that these objections alone are fatal to the practical success of these particular systems of excrement interception. The failures that have attended the attempts of well-meaning but unpractical people to carry out their schemes have naturally caused the advocates of interception to find a method which should render unnecessary the use of any absorbent material whatever.

In some towns the pan system has been adopted for the collection of excreta simply, no attempt being made to add ashes or any other absorbent. On the contrary, such addition is strictly prohibited, the object being to make from the pan contents, by evaporation of the fluid portion, a concentrated manure or *poudrette*, rich in that valuable fertilizing agent, ammonia, which commands a high price in the market. The mixed fæces and urine are evaporated, after mixture with a certain amount of sulphuric acid to fix the ammonia, in a closed vessel called a "concentrator," furnished with revolving arms for stirring the contents, at a temperature of about 280° Fahr. The evaporation of the watery portion is also favored by the production of a partial vacuum, produced by

means of an extracting fan. This arrangement is known as the Rochdale system. It possesses certain advantages over the midden-privy, inasmuch as it diminishes the filth surface exposed, it prevents soakage into the ground, and, by the exclusion of everything except fæces and urine, allows of the production of a manure of considerable value. These advantages are possessed by the system when it is well carried out; but under these favorable circumstances it has many drawbacks, and, moreover, it is not always well carried out. Under favorable circumstances, however, a mixture of solid and liquid excrement, which very soon begins to putrefy, cannot be otherwise than exceedingly offensive and dangerous to health. The pans are, therefore, totally inadmissible into the interior of a house; they cannot safely be placed in small yards and therefore near dwellings, but only where there is a large area of yard admitting of free movement of air at command, which is by no means common in large towns. Their removal once a week, which in some cases has to be effected through houses, is necessarily attended with much aggravation of the nuisance.

Under unfavorable circumstances, however, the system is filthy and dangerous to an extreme degree.

In the hands of careless tenants the pans are sometimes filled, before the expiration of the week, by the improper addition of bedroom or other slops, which they were never intended to receive, and which should properly be consigned to the drains; the condition of the privies and yards under such circumstances can be imagined; the floor of the former is inundated with the filthiest possible liquid, and they become impossible to be used by any decent person. Overflow of the contents is liable to occur also from any unusual delay in exchanging the receptacles, whether caused by neglect, forgetfulness, or stress of weather, as during deep snows and severe frosts.

Leakage also may occur from corrosion and wear and tear of the pans, a very small hole permitting the escape of sufficient liquid to render the closet totally unfit for use.

The men employed in the removal being of a class not to be expected to display much care or sanitary knowledge, too often perform their work in a very imperfect and improper manner, neglecting those precautions which are essential to the pre-

vention of nuisance and the protection of health. Moreover, the transport of the receptacles through the town to the depot, partly by hand and partly by wagons or vans, cannot fail to lead to the diffusion of offensive and noxious vapors and the spilling of some of the liquid contents along the route. This state of things would be bad enough with normal excrement, but what is to be expected from the diffusion and scattering of such matters if infected ?

Having briefly reviewed the various interception methods, as they are technically called, it remains to say a few words about the water-carriage system of sewage disposal.

The channels by which this water-carriage is effected are the sewers, for sewers are indispensable in all cases, whether a dry system of excrement disposal be adopted or not ; but the sewers formerly were restricted to the conveyance of rainfall, surface drainage, and slops. Probably they were ill adapted, either as to capacity or structure, for conveying the fæcal discharges of populations in their entirety ; at any rate, the introduction of these into the sewers was strictly prohibited until within the memory of many living. By and by, as populations grew more dense and cesspools became unmanageable, these latter were surreptitiously connected with the sewers, and a practice at first sternly interdicted was next winked at, and finally freely permitted, till at length a complete change of opinion took place, cesspools in their turn were strictly prohibited, and the direct drainage of water-closets, middens, urinals, and all other sources of excrementitious matter into sewers, where existing, was even made compulsory. So that every town which has a system of sewerage, whether it contains water-closets or not, is already conveying a sewage essentially excremental in character, for it is impossible to exclude urine and soluble excrement draining from ashpit-middens and urinals, similar impurities from the general surface yielded by the droppings of animals in the streets, stables, cowhouses, pigsties, and elsewhere. The quantity of impurity thus introduced must be enormous, however much advocates and executors of the interception method may desire to prevent it. But this is no matter of speculation ; it is well known by all who have gone into the question that the sewage of a town having no water-closets is only slightly better than

that of a water-closet town ; this is seen by the results of the analyses made by Dr. Frankland in connection with the Rivers Pollution Commission, the amount being stated in parts per 100,000 :

	Dissolved Matters.						Suspended Matters.		
	Total solid matter.	Organic carbon.	Organic nitrogen.	Ammonia.	Total combined nitrogen.	Chlorine.	Mineral.	Organic.	Total.
Average midden town....	82·40	4·181	1·975	5·435	6·451	11 54	17·81	21·30	39·11
Average water-closet town .	72·20	4 696	2 205	6·703	7·728	10·66	24·18	20·51	44·69

It is clear, then, that by the water-carriage system of excrement disposal there is no material increase in the impurity of sewage ; this is accounted for by the fact that with somewhat more fæcal matter the amount of water is proportionately, or nearly so, increased, while the advantage is gained of a fuller sewer flow, with diminished liability to the occurrence of deposits and the resulting evil of the generation from them of sewer gas. This particular sanitary objection to the water-carriage system is therefore satisfactorily answered.

Another objection is that water-closets and sewers are too often causes of ill-health by their defective construction or condition. The answer to this simply is, that no system which is improperly carried out can satisfactorily fulfil its purpose, and that water-closets and sewers are capable of being constructed which completely satisfy all the requirements of health, comfort, and decency.

Occasionally an insufficient supply of water is pleaded as an obstacle to the method, but I believe this difficulty is very much exaggerated, and that, generally speaking, "where there's a will there's a way" of obtaining the further necessary supply. It is only a question of expense, and there is no reason why money should be applied to the establishment of systems of earth-closets, midden-closets, or tub and pan closets, rather than to the provision of more water. If the former entailed no great expense the argument for their preference

would have some force, but it is not yet proved that they are not more costly than the water-carriage system. Sometimes the difficulty of obtaining land or suitable land for irrigation is urged against the method. This difficulty is often made too much of, especially as erroneous views, founded on theory rather than practice, have been entertained respecting the quantity of land and the kind of soil necessary. Experience proves that soils of the most different kinds are capable of effecting the purification of sewage, though, of course, light sandy soils are, as a rule, best suited to the purpose. According to Dr. Frankland, the results of irrigation of different kinds of soil were much more uniform than might be expected. At Norwood a clay soil removed 76 per cent of dissolved organic carbon and 92 per cent of dissolved organic nitrogen; at Warwick a stiff clay removed 71·7 per cent of carbon and 89·6 per cent of nitrogen; at Banbury a soil consisting principally of clay removed 87·8 per cent of carbon and 91·3 per cent of nitrogen; at Croydon a gravelly soil removed 73·2 per cent of carbon and 93·2 per cent of nitrogen; while at Aldershot a light sandy soil removed 91·8 per cent of carbon and 87·3 per cent of nitrogen. In all the cases cited 100 per cent, or close upon it, of the suspended organic matter was also removed. It thus appears that with good management almost any soil is or may be made suitable for the purification of sewage.

As to the quantity or area of land necessary, without quoting the very variable opinions of engineering and other authorities, I may state, on the authority of Mr. Till, the able engineer of the Board, that for the actual disposal of the sewage of Birmingham and neighborhood, under the management of the Birmingham Tame and Rea District Drainage Board, embracing an estimated population in 1885 of 619,693 persons, an area of 1227 acres is found amply sufficient, and more than sufficient. This area is equal to one acre to 500 persons. The volume of sewage is in ordinary weather 16,000,000 gallons a day, which, supposing it to be equally distributed over the whole area of the sewage farm, would give 13,040 gallons per acre. The land is drained to a minimum depth of 4 feet 4 inches, though in many cases the level character of the land has rendered a greater depth necessary at the lower ends of the drains. The effluent is so pure that to

the eye it appears, as regards its colorlessness and transparency, fit to drink, and on admission into the little country brook of clear water it is seen before mixing with it to be very superior in appearance to the natural water of the stream by the side of which for a time it runs. A few words in explanation of the mode of treatment of the sewage may not be out of place. At a distance of about a quarter of a mile from the subsidence tanks the main sewer receives a constant supply of thin milk of lime, the use of which is to neutralize acids and promote the precipitation of organic as well as mineral matter. In the first tanks road-detritus and other heavy matters are deposited, and in the other tanks the lighter suspended matter is precipitated. The sewage, thus to a certain extent defæcated and clarified, is carried by a conduit nearly three miles long to the land, where it is disposed of by distribution over the surface. The sludge which has collected in the tanks is removed by bucket-pumps, and conveyed along elevated and movable wooden carriers to a part of the farm, of about forty acres in extent, situated at the near or upper end. After about a fortnight it has become by drainage and evaporation contracted in bulk, and sufficiently consistent to admit of being trenched into the land. Crops are then planted, the soil soon regains its usual characters, and it may afterward be irrigated like the rest of the land.

It might be supposed, as some indeed have asserted, that so large an expanse of sewage-treated land must necessarily be not only a nuisance but injurious to health. I can assert from years of experience that it is neither the one nor the other. The people who hazard these speculations draw their conclusions from the fact that putrid manure heaped or strewed on land is offensive ; but with sewage the conditions are altogether different. In the first place, it is not putrid but fresh, and instead of being heaped or strewed, it trickles in a thin layer in contact with and in the pores of the land, the deodorizing and purifying powers of which are so well known. Hence there is no nuisance, and as to injury to health, some of the employés live with their families on the farm, and not only have never suffered from typhoid-fever or other filth diseases, but have enjoyed exceedingly and exceptionally good health. Nor is the method an altogether unprofitable one. The crops

raised on the farm, and the area devoted to each kind, are as follows :

280 acres to mangolds, swedes, and kohl rabi.
250 " " market-garden produce.
100 " " Italian rye grass.
130 " " cereals.
340 " " pasture.

The milk produced is large in amount, and its production continues to increase. The quantity sold last year was 128,995 gallons, realizing a sum of £4406. Altogether, for the sale of stock and produce, £20,008 was realized last year, and stock was purchased during the same period to the value of £7760. From these facts and figures it can be seen how valuable is the return in food and money yielded by a sewage farm.

I am aware that the opponents of sewage farms have endeavored to show that the produce of such farms is open to the suspicion of danger. It has been asserted that butter so raised is inferior in quality, that it will not keep, and in a very short time becomes intolerably offensive in odor ; while it has been further suggested that dangerous parasites may find their way from the sewage on to the vegetable produce, and from this into the system of the cow, rendering its flesh unfit for food. I have experimentally proved the incorrectness of the allegation regarding butter, and a special and crucial investigation, carried out under most competent authority, into the question of the health of animals fed on sewage farm produce, resulted in the complete refutation of the idea that it suffered as suggested, or in any other way.

Independently of the merits of the water-carriage system which I have referred to, I consider it possesses one advantage over all others which entitles it to our unhesitating acceptance. To us, as sanitarians, the profitable exploitation of a method must hold a secondary place ; the first consideration with us must be its sanitary bearing, and I think no one will be found to question the view that the retention in our midst of excretal and other forms of filth until they pass into putridity, or even for a moment longer than necessary, is the violation of a natural law, and is practically fraught with the most insidious and the greatest injury to health. It is to my mind the chief

sanitary evil of the present time ; and though much has been done to cleanse the Augean stable of our towns, with the satisfactory result of annihilating some diseases, mitigating the severity of others, and generally raising the standard of health and the duration of life, yet we cannot hope for much greater improvement until we discontinue the retention among us of impurity of every kind. Now, all the interception methods—and by this they stand condemned—have this cardinal defect of retention, while by the water-carriage system the excreta are readily and instantly carried away by gravitation beyond the possibility of doing harm, and are placed where alone they can possibly do good, viz., on the land ; in the one case they are filth, or "matter in the wrong place," and in the other they are applied as valuable manure to their legitimate and most beneficial use. But while water-carriage possesses this great advantage over all others, I believe it will be found, under proper management, to be also the most economical, or, in other words, to entail the least loss.

You will gather from my remarks that I disapprove not only of interception methods of all kinds, where water-carriage is possible, but of the disposal of sewage by running it into a river, as in the metropolis, or the sea, as at Brighton, if it can possibly be avoided, and this both on sanitary and economical grounds ; for though it may not in every instance be possible to utilize it, I believe that it is possible in the majority of cases. Supposing that the sewage of London could be utilized on land to the same effect as in Birmingham, what now is lost to agriculture, run away to waste and the injury of the river, could be made to produce in vegetables, milk, and butcher's meat no less a sum at least than £200,000 per annum, besides finding useful employment to a large number of agricultural laborers who are sorely in need of it.

Many atttempts have been made to utilize sewage by processes of precipitation and conversion of the precipitate into manure. These attempts, for the simple reason that the ammonia, which is the only ingredient of much value, is not precipitated but runs away with the effluent, always fail to prove profitable, and they fail to purify the sewage sufficiently to render it fit to be discharged into streams ; so that although simple and comparatively inexpensive modes of precipitation

may sometimes be advantageously employed preparatory to the effluent being utilized for raising crops by irrigation, used alone they neither sufficiently purify nor utilize the sewage.

I have very little time left for the consideration of the disposal of ordinary house refuse, but, granting the exclusive existence of a water-carriage system in a town, it becomes a comparatively simple matter, and very different from what obtains under the ashpit-midden system, where house refuse and excreta are mixed together. The only requirement for each house is a simple ash-bin, best of impervious and non-absorbent material, which should be reserved for the reception of ashes and non-putrescible refuse as far as practicable. It should be placed outside the house, at as distant a point as possible within convenient limits, provided with a cover, the contents kept dry, and emptied at short intervals.

Where it is impossible to avoid the introduction of animal offal and vegetable refuse, which, however, should be burnt wherever fires are available and sufficient, it is imperative that the bins be emptied every day, *i.e.*, before there is time for putrefaction to set in. The contents of such receptacles can be removed without nuisance, and readily disposed of either in appropriate places of deposit in the country, or, failing these, which are yearly becoming more difficult to obtain, by means of the Destructor Furnace, which has of late years come into partial use in large towns. Bearing in mind the undesirability of filling up hollows with refuse and subsequently erecting buildings upon it, the destructor becomes a most desirable means of dealing with it. For the last ten years this plan has been in use in Birmingham. When the house refuse reaches the depot it is submitted to a rough sorting ; the larger pieces of iron, earthenware, and glass are taken out, also the cinders and coke. The iron is sold, the earthenware and glass are ground up with lime to make mortar, the cinders and coke are economically used as fuel for the destructor, while the finer combustible matter—ashes, wood, straw, rags, paper, etc.—are consigned to the destructor, in which all organic matter is completely and harmlessly destroyed. The mineral matter becomes partially fused to a heterogeneous mass called clinker, which constitutes about one-sixth by weight of the original material, and is variously used for making the foundations of

roads and floors, a portion being ground with lime to make mortar, cement, paving slabs, wall copings, etc.

Endeavors to utilize house refuse to a still greater extent are now being made, and there is a strong probability that they will be successful. The paper and rags, which hitherto have been destroyed, are picked out of the refuse, cleansed, dried, and converted into brown paper of very good quality, while the other ashbin contents are separated in a tank by a double current of water into coke and other light matters which float, and coal, etc., which sink. The former, excepting corks, are used as fuel in the furnace for producing steam power (the corks may be used in the manufacture of kamptulicon) ; the latter it is proposed to utilize for making gas or in some other way. Even road sweepings are turned to account, the sand and siliceous matter being removed and cleansed by washing and subsidence, and used for making mortar and for other purposes for which it is suitable, while the washed fibrous matter which floats is believed to be capable of some useful application. Such attempts to turn waste products to profitable account are most desirable, and deserve every encouragement.

As a result, then, of the comparisons I have made over a considerable period of time of the various methods of sewage disposal, the conclusions I have come to are :

1. That all intercepting or conservancy methods are false in principle, and on a large scale hurtful in practice.

2. That the system providing for the most complete absorption and deodorization, and the most frequent removal, is the one to be preferred where water-carriage is impracticable.

3. That the water-carriage system is preferable to every other on the grounds of convenience, health, and economy.

I feel that I have treated the comprehensive subject of my address very imperfectly and very incompletely, but I trust that the fact of my having dwelt upon it will attract to it the attention its importance deserves, and result in some practical advantage.—*From The Sanitary Record.*

THE WORK OF THE PLUMBER AND THE MODES OF CONVEYING AND DISPOSING OF SEWAGE.*

By J. J. Powers, C.E., of Brooklyn.

My connection with the plumbing trade began some twenty years ago, at a period when the favorite metal for soil and waste pipes was lead ; these pipes were usually supported by straps of sheet lead soldered to the pipe on either side and secured to the walls with screws or hooks. The vertical soil and waste pipes in buildings were considered the proper place to display the skill and taste of the mechanic, and the work on them was generally good and well jointed. The traps used were all made by hand, being beaten out of sheet lead in two pieces and soldered together on the sides. The manufacture of these traps constituted a large part of the plumber's shop work in the winter months. Age and experience, however, developed the facts that no matter how well the lead pipes were supported their weight "sagged" them, and the fastenings being immovable, the result was a break at the upper or lower side of each support, and the traps and bends were usually corroded through at the edge of the soldered seam which united the two sections. Added to these unfavorable experiences was the fact that the progressive intellect of man had discovered how to make very thin lead pipes. The old lead pipes were expensive and troublesome to repair, and it pained the plumbers to have to make such large charges for repairs to their customers, so they sought for a substitute, which they found in iron. Unfortunately, they still retained the notion that soil and waste pipes must be very thin, and as the germ theory had not yet been introduced into the plumbing business, the necessity for air-tight joints between the lead branches and the iron hubs were not generally realized nor acted upon. The horizontal house sewers were generally constructed of glazed sewer pipes, which were laid beneath the cellar floors by laboring men, who usually paid more attention

* Paper read before twelfth annual meeting of New Jersey Sanitary Association, Trenton, N. J., November 20th, 1886.

to grade and alignment than to perfect jointing. In the cheaper class of houses the water-closet traps on the second floors were considered sufficient seal for all the waste pipes leading to the various basins ; this was a serious mistake, because under this arrangement there were frequently from thirty to sixty feet of untrapped waste pipe, and from their filthy gelatinous linings gases of decomposition escaped into the sleeping-rooms ; but as the development and escape of gases were not at that time considered by the architect who designed or the plumber who constructed, the plumbing of houses in that period was not of a nature to fulfil the requirements for the prevention and exclusion of sewer gases from polluting the air within the dwelling. Plumbers never introduced vent pipes except in cases where they had reason to expect an "air bind," and only did it then to facilitate the flow of water. In brief, the plumber's work was considered successfully accomplished when the water freely ran from the supply pipes, and the waste waters were quickly carried off through the discharge channels. But these halcyon days soon came to an end : the rapid growth of the cities and consequent impaction of people was followed by a rapid increase in the number of cases of infectious disease. The steady, persevering and critical researches and investigations by our self-sacrificing and public-spirited friends and benefactors, the medical practitioners of these communities, eventually revealed the fact that some connection existed between these diseases and defects in the plumber's work ; this was the first step toward improvement, and to physicians alone are the public indebted for the advance in experimentation and investigation. After this rapidly followed the evolution of the sewer-gas theory, which resulted in forcing upon the plumbers many microbes and sanitary engineers to be taken care of in some manner least prejudicial to the public health, and, as the plumber's knowledge of animalcules was comparatively limited, owing to the fact that up to this period he had not been obliged to study nor be responsible for any microbe more diminutive than the average plumber's helper, his position was very unpleasant, particularly so as these microbes, when inhaled by the plumber, utterly refused to develop disease within his germ-proof internal organs ; consequently he was

thereby prevented from forming any judgment based on practical experience, for plumbers seem to thrive on sewer gas physically as well as financially.

The results of the first efforts in ventilation in a great number of cases intensified instead of correcting the evils, because sheet-iron pipe was used to extend the soil and waste pipes to the roofs. The waste pipes of basins were trapped at the basin end as well as in the water-closet trap. Ventilating pipes were carried into chimneys, yard vaults were abandoned and water-closets substituted in cellars, all of which tended to make bad worse ; but as soon as the plumbers commenced to understand the fact that their business had assumed a professional character, requiring from them a certain amount of scientific knowledge, it must be admitted that they made strenuous efforts to meet the requirements of the physicians, and have certainly made marvellous progress, considering the fact that the knowledge required had to be attained immediately, yet was of a character difficult to comprehend without long study, combining as it does elements of chemistry and hydraulics.

The improvements in plumbing within the last ten years are simply phenomenal. The bath-rooms and water-closets are as clean and odorless as the parlors, when good fixtures are used and properly set. The great competition has brought the price of first-class fixtures of all kinds down so low that there is no excuse for any property-owner not to provide his houses with suitable and cleanly fixtures ; but there is one improvement that is very desirable, and inexpensive, that should be adopted in every new piece of work or alteration—that is, when the main lines of soil and waste pipes are in, and the lead branches carried to beneath the location of the various fixtures, the ends should be stopped and the whole system filled with water to the roof, to prove the reliability and tightness of the work ; and in all cases extra heavy iron pipe and fittings should be used and lead pipes for branches of corresponding thickness.

The rules for the arrangement of soil and waste pipes, and the proper trapping thereof, are so well laid down in the printed forms of the Brooklyn Board of Health and so familiar, that I do not think it necessary to enlarge upon that subject.

The question of trapping I will illustrate by an experiment showing you the merits of the two forms of traps commonly used—the syphon action is so apparent and well known that it is not necessary to dilate upon it.

In regard to the question of final disposal of human excreta and wastes the plumber is continually called upon to decide how to dispose of the sewage from isolated mansions. Until within a comparatively recent period the method of disposal was by discharge into deep cesspools built of stone and brick, laid up loose-jointed so as to permit of soakage into the earth. This was the accepted and favorite method of disposal on many homesteads during the past century or more, and for convenience the privy, cesspool and well were located contiguous to the house, and close together. In course of time the earth between the cesspools and wells became saturated and the sewage found ready means of inflow into the well, where it was finally disposed of by being used for domestic purposes and drank by the family, and their guests or boarders who had visited those sylvan shades in search of health. This method of disposal had so many serious objections that, in deference to the prejudice of the guests and their physicians, it was abandoned, although it was not easy to convince the people who had used the wells for many years that the method was not specially advantageous.

Now the provision of cesspools, even if water-tight and ventilated, is universally condemned, except as a temporary expedient while awaiting the construction of sewers. The disposal by intermittent discharge into irrigation tile is always preferable, but requires considerable land. The question is rapidly becoming very serious for inland towns, and great progress will necessarily be made in the next few years.

I believe that all the sewage which is discharged into the earth or streams should be chemically treated before discharged, so as to minimize the absorptive work in the soil. In large plants the chief object to be attained is a minimum of offence at the place of precipitation and treatment, and as complete a clarification of the fluids as possible. To fully illustrate my views, I will demonstrate by two experiments, showing the two systems owned and designed by me for the chemical treatment of sewage by per chloride of iron and chlorine. I have

both systems in successful operation, and am satisfied with the result.

The plumber of the future should combine and possess the professional education of sanitary engineering with the mechanical knowledge of his trade to do justice to the business, which is fraught with so much interest to the welfare of the community, and I hope to see suitable provision in the colleges of the country for the acquisition of this knowledge.

I believe that the plumber is in a more receptive condition for this knowledge after he has acquired his mechanical skill, and think the proper place for him to receive it is at the medical colleges, in the form of courses of lectures and experiments which will convey to him a sense of the great responsibility devolving upon him in the construction of his works ; and as the physicians and chemists are the persons who must necessarily first observe and recommend the need of hygienic changes in the dwelling, the plumber should also have the benefit of their counsel and instruction in the science of his trade, including disinfection.

TRAP SYPHONAGE.*

By Glenn Brown.

The experiments on trap syphonage made by S. S. Hellyer, of London, and similar experiments conducted by Philbrick and Bowditch, of Boston, clearly proved the utility of trap ventilation. The experiments of George E. Waring, of Newport, and J. Pickering Putnam, of Boston, as clearly (apparently) proved the uselessness of such ventilation. In the preparation of a work on plumbing I found this conflict of authorities very perplexing. In fact, it was impossible for any one to form a definite conclusion on the efficiency or inefficiency of trap ventilation without actual experiment. The difficulty and the object to be attained were laid before Dr. J. Mills Browne, Medical Director United States Navy, in charge

* Abstract of Report on Experiments in Trap Syphonage at the Museum of Hygiene, United States Navy Department, Washington, D. C., read before the twentieth annual convention of the American Institute of Architects, New York, Dec. 1, 1886.

of the Museum of Hygiene at that time. Upon consulting with the surgeon-general of the navy, the subject was thought of sufficient importance to have a system of iron and lead pipes with fixtures erected outside of the museum building. With these pipes I have been conducting experiments from the fall of 1885 to the present time, as opportunity would permit. The waste and vent pipes are of the sizes used and arranged as in common practice. The traps on which the tests were made were selected so as to cover the different kinds in the market, both mechanical and non-mechanical. The apparatus is so arranged that the fixtures can be subjected to a strain equal to what they would receive in actual use, as well as strains more severe than they would have to withstand, except in unusual contingencies.

The points or places of inspection, and for the attachment of traps, are platforms located on the first, second, third and fourth stories. By this arrangement the effect of water discharged from varying heights can be thoroughly tested in their relations to the different stories of a building. There is a marked change in the effect produced in different stories of a building by a discharge of water from the same point. The main stack of pipe is of 4-inch extra heavy cast iron, starting at a connection with the sewer (branches, valves and connections being inserted at the proper points), and running thence a distance of 32 feet horizontally, and 42 feet vertically, to a point above the roof of the building. In the second story there is an auxiliary stack of 4-inch lead pipe connected with the iron pipe, and running to a point above the roof. Both the iron and lead pipes have running traps and fresh-air inlets near their point of commencement, with valves and screw-plugs by which they can be partially or completely closed, as desired. By means of a Y branch the system can be made to empty into the sewer without passing through the running trap. Either outlet can be used at pleasure, both being governed by gate-valves. Two stacks of 3-inch vent pipe (one lead, the other iron) run vertically from the second story to the roof, thence horizontally along the roof. By means of plugs and valves the lengths of the vents may be varied from a few feet to 42 feet, and the openings from 0 to 3 inches. The outlets in both the soil and vent pipes are so arranged

that traps from 1¼ to 4 inches can be attached at pleasure, all outlets not in use being cut off by gate-valves or screw-plugs.

Syphonage, caused by the discharge of water through the trap itself from a fixture above, has been found of very little consequence. Syphonage rarely takes place ; the water passing over the long arm of the syphon rarely fills the pipe so as to cause the necessary vacuum. When it does take place the trap fills by the drainage from the fixtures above, such as the wash-basin or sink. The back pressure which comes from sewers would never force the seal of a trap in a house plumbed according to modern practice, the fresh-air inlet and the top of the soil-pipe being always left open. The greatest danger arises from the discharge of large bodies of water down the long vertical 4-inch pipes. This column acts to a certain extent like a piston, compressing the air in front of it and creating a vacuum behind it. The air rushing in to fill the vacuum forces or draws the water from the traps into the soil-pipe, while the compressed air finds its easiest mode of escape through the traps below the point of discharge, even when there is a fresh-air opening between the running trap and the house. Although the water, in case of back pressure, is driven up into the pipe or fixture above the trap and then returns to the trap, the sewer air passes into the house. The majority of the experiments have been made to test the power of traps to resist the syphonage and back pressure produced by the column of water passing down the vertical pipes.

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RECAPITULATION.

The Vent-Pipes on Trap Open.—In experiments No. 1 to No. 9, the top of the soil-pipe being closed, the only means of ingress for air to fill the vacuum is through the traps of their vents. This is the most severe test to which the traps can be subjected for syphonage. The fresh-air inlet being closed, the air in the pipes between the down-coming water and the running trap must necessarily find its way out through the running trap or through one of the traps connected with the soil-pipe. A strong current of air did in every case pass outward through the vent pipe. Such strains would never occur in actual work unless the soil-pipe and fresh-air inlet

should happen to become stopped. This is of rare occurrence in the top of the soil-pipe, sometimes happening from collections of snow or frost. The fresh-air inlet, as it is generally put in, may be easily closed by earth or dirt collecting on the perforated or grated opening. Experiments from No. 9 to No. 11 : The fresh-air inlet was open ; back pressure was not great, while the syphon effect was the same. The condition of experiments from No. 11 to No. 34 was what would exactly have to be encountered in actual practice. The simple lead **S**-trap is acknowledged by all to be the trap which is the most easily syphoned. It will be seen by referring to the experiments from No. 1 to No. 34 that in no case was I able to syphon or force by back pressure the seal of an **S** or any other kind of trap when it was properly vented. From that I conclude that

Traps when Properly Ventilated are not Syphonable.—It has been asserted that when the vent is placed on the crown of a trap that in time it becomes choked up by refuse matter adhering to the surface. In these experiments the vent has been put in different positions, and it makes no difference in its effectiveness as long as it is between the trap and the vertical soil-pipe. With a little care the **Y** can be so placed and shaped that matter passing through the pipe would not adhere to the vent. Experiments from No. 20 to No. 34 were tried with the vent on roof more or less closed. By these it can be seen that a vertical vent-pipe less than 3 inches, when the trap is connected with the 4-inch soil-pipe, causes a commotion in the trap, and a pipe of half its area with a discharge from the tank through a 2-inch opening in the tank drew $\frac{5}{8}$ inch out each time. This discharge was no greater than would come from a bathtub. The trap was completely syphoned when the outlet was seven-eighths closed, with a discharge equal to three plunger closets.

When the Vents were Closed.—From No. 35 to No. 99. All traps failed from either syphonage or back pressure. The experiments from No. 35 to No. 48 : The top of the soil-pipe was open and the fresh-air inlet closed, in this way submitting the traps to the most severe strain they would have to withstand from back pressure. Every trap failed, except the ball traps.

Experiments from No. 49 to No. 65, inclusive : The soil-

pipe and fresh-air inlet being open were similar to the action traps would receive in every-day use. In every case the traps failed or syphoned, except the Sanitas. I would call special attention to several experiments, No. 49 to No. 59. The discharge being 15.5 gallons through the 2-inch opening in the tank, was hardly as severe on the trap as a discharge from a bathtub. In every case, except that of the Sanitas, the traps failed. Experiment No. 49 : A large 4-inch S-trap and a $1\frac{1}{4}$-inch Bennor's trap were connected with the soil-pipe branch in the third story ; 15.5 gallons discharged through the 2-inch opening in the tank. The Bennor's trap was not affected, while the 4-inch S-trap was completely syphoned. In this case the S-trap formed a vent for the smaller trap. . . . No. 52 : A Sanitas trap was put in at the same place ; same discharge as above. Half of the water was taken out of the trap. The air passed out of the trap rapidly, creating a continuous commotion in the water. The bulk of the water seemed to be thrown out against the separator in this trap and to fall back without passing out.

In No. 49 a 4-inch trap similar to a hopper-closet trap and a small wash-basin, Bennor's trap, a combination often found in bath-rooms, and a large S-trap were syphoned by a discharge no greater than would come from a bathtub in a story above. Such traps will always be used, and should never be put in without vent-pipes. No. 55 to No. 60 : Intended to represent a water-closet, wash-basin, and bathtub connection, water extracted from traps at each discharge, and the Bowers' trap acting as a vent ; the water was taken out to the seal at the third discharge. The wash-basin or bath-trap was then partly closed, as would happen in actual use, by the plug, and the S-traps were syphoned by a discharge no greater than would come from a bathtub in the fourth story. Experiments Nos. 66 to 71, inclusive, were more severe than such traps would be subjected to except in unusual contingencies—*i.e.*, the stoppage of the two air-inlets. All failed. These tests were no more severe than ventilated traps were subjected to.

In the experiments from No. 72 to No. 89 inclusive the syphon action was greater than actual practice, while the effect of back pressure would be less the air confined between the running trap and the soil-pipe saving free escape through

the fresh-air opening. No. 85 to No. 89 show how the air in the soil-pipe was forced through the trap. All the traps failed. Experiments No. 90 to No. 99 were with discharges into a horizontal pipe on the ground floor. The traps were not affected, although the vents were closed. No. 94 to No. 95 : Water discharged from the tank in the fourth story blew the water out of the trap. Back pressure seems from the experiments to be a more important feature in plumbing than is generally supposed. Although the fresh-air inlet was open the air confined in the pipes almost invariably found egress more easily through traps on second and first floors than through the opening near the foot of the soil-pipe. No trap withstood back pressure better than the others (see Deduction 6).

DEDUCTIONS.

1. The seals of ventilated traps are safe against syphonage and back pressure.

2. The seals of unventilated traps are never safe from syphon action or back pressure, except in deduction 4.

3. The vertical vent should be 3 inches, with a 4-inch soil-pipe.

4. Traps connected on a horizontal pipe and fixtures discharging on the same level into horizontal pipe apparently have no effect on unventilated traps.

5. All varieties of non-mechanical traps are more easily affected by back pressure than by syphonage.

6. The ball traps were not affected by back pressure, but by syphonage.

7. The Sanitas trap withstood syphon action better than any of the patent traps, but was easily affected by back pressure.

8. The sewer air is more likely to enter unawares by back pressure through the seal of the trap, because the seal remains unbroken.

9. Difference in friction of iron and lead pipes made no apparent difference in the effect on the traps.

The experiments will be continued as to other matters of moment. Experiments have been made on evaporation of water in traps and the different methods of testing soil-pipes for leakage, but the matter is not yet sufficiently complete to put in this report.

THE OLD ROMAN LIFE TABLES, AND THE PROBABILITIES OF THE DURATION OF LIFE AS COMPARED WITH THE PRESENT.

WE present below a communication from Mr. Justice Bradley, of the United States Supreme Court, to Mr. Sheppard Homans, which will be read with interest by all life insurance students. Mr. Bradley's reputation as a mathematician is only second to his reputation as a jurist. In his earlier years he found time in the midst of his professional labors to fill the position of actuary for the Mutual Benefit Life of New Jersey. It would be difficult to mention a field of knowledge which his diversified scholarly tastes have not led him to explore. Judge Bradley wrote the letter below in ignorance of the fact that Cornelius Walford had also called attention to Ulpian's tables in his *Insurance Guide and Hand Book.* The views presented by Judge Bradley, therefore, are the result of a wholly independent investigation of the original authorities, and it will be seen that his conclusions are materially different from any that have heretofore been presented. By Mr. Walford and other writers heretofore the table has always been regarded simply as one of life expectations—that is, the interest element which plays so important a part in all modern annuity tables was left out of view. But Judge Bradley shows good reason to believe that instead of this being the case the interest element entered into the Roman computations just as it does into those of the moderns, and that the fundamental principles on which the science of life insurance rests were in a measure, at least, understood by Roman scholars. The letter is as follows :

WASHINGTON, D. C., October 15, 1886.

Sheppard Homans, Esq. :

DEAR SIR : In looking over the Pandects of Justinian the other day I fell upon the Roman method of calculating the value of life interests which may interest you. It is in Lib. 35, Tit. 2, Law 38. I send a translation of the article, which is extracted from the works of the great lawyer Ulpian, who

wrote in the reigns of Severus and Caracalla, A.D. 200–225, The extract is taken from a nearly contemporary writer by the name of Semilius Maceo, who wrote a book on the Succession Tax. It is as follows :

" Ulpian writes that this is the mode of computing the value of maintenance [for life]—namely, for persons of twenty years and under, thirty years of maintenance, including the Falcidian portion [this means thirty years' purchase of the annual value] ; for those of twenty to twenty-five years, twenty-eight years' maintenance ; for those of twenty-five to thirty years, twenty-five years' maintenance ; for those of thirty to thirty-five years, twenty-two years' maintenance ; for those of thirty-five to forty years, twenty years of maintenance ; for those of forty to fifty years, as many years as the person lacks of sixty, less one ; for those of fifty to fifty-five, nine years ; for those of fifty-five to sixty, seven years ; for those of sixty and over, five years ; and the same rule is employed in computing usufructs [*i.e.*, the use of lands for life]. It is usual, however, to compute thirty years for all those under thirty, and for those over that age, as many years as they lack of sixty. If a usufruct is bequeathed to the State, either generally or for the maintenance of games [of course, in perpetuity], it is estimated at thirty years' purchase."

The Falcidian portion mentioned above is that portion (namely, one quarter) which belonged to the heir in his own right, and which the testator (if his father, mother, etc.) could not deprive him of. Taking out this quarter in each case, and comparing the result with one of our modern tables of annuities for life, we have the following interesting exhibit :

For a life aged	Valuation in years' purchase.	Annuity of $1 for life as per Carlisle table 3 per cent.
0—20	22½ years.	17⅓ to 21⅜
20—25	21 "	21⅜ " 20⅜
25—30	18¾ "	20⅜ " 19½
30—35	16½ "	19½ " 18½
35—40	15 "	18½ " 17⅓
40—50	14½ to 6¾ "	17⅓ " 14⅛
50—55	6¾ "	14⅛ " 12⅛
55—60	5¼ "	12⅛ " 10½
60—80	3¾ "	10½ " 4⅛

In the above comparison I use the Carlisle three per cent table, because it is evident that the three per cent basis was used by the Romans, from the fact that thirty years' purchase was estimated as the value of a perpetuity ; and as lands and the incidents of landed property, such as slaves, cattle, etc., constituted the principal wealth of the Romans, it is probable that three per cent was a fair estimate of the profits of an estate.

An inspection of the foregoing table leads to two interesting conclusions : first, that the Romans had made quite intelligent observations on the average expectation of life ; and secondly, that after middle life this expectation in the Roman Empire was much less than it is in our times in civilized countries.

If you think the item worth preserving you are at liberty to give it to the public in such manner as you think fit. It may be very common knowledge among life insurance men.

Yours respectfully,

J. P. BRADLEY.

—*The Insurance Monitor.*

ARE SMALL-POX AND COW-POX ONE AND THE SAME DISEASE?

By GEORGE FLEMING, LL.D., Principal Veterinary Surgeon of the British Army.

FOR many years now the medical profession in this country seems to be generally agreed that human variola and cow-pox are one and the same malady, the latter being merely small-pox modified through transference to the bovine creature. In books, letters, and lectures there is evidence of this belief, and the latest proof of its existence is to be found in the Harveian Oration recently delivered by Dr. Pavy, in which we find the following statement : " It may now be regarded as an accepted conclusion that vaccine lymph is the virus of small-pox, modified by transmission through the cow." If it be not rank heresy to throw doubts on a conclusion accepted by such high authorities in human medicine as Dr. Pavy represents, will you kindly allow me, a very humble student of animal medicine and comparative pathology, to dissent from this generally accepted

conclusion, and to express strongest doubts, or even entire disbelief, as to the one malady being merely a modification of the other? The question would not, perhaps, be of so much moment had not at least three serious accidents resulted from carrying the above conclusion into practice; and as more disasters may yet be due to the same notion, I submit that it is high time the supposed facts upon which it is based should be examined, in order that the truth may be arrived at. The most notable authority for the statement made by Dr. Pavy, in this country at least, was my old friend, the late Mr. Ceely, of Aylesbury, who reported that he had succeeded in producing cow-pox by inoculating a cow with small-pox matter. But it must be remembered that he, at the same time, was experimenting with vaccine lymph, and the great probability is, that he employed the latter when he thought he was using the former. At any rate, he never afterward succeeded in repeating his presumed success, though his subsequent trials were made under the most favorable conditions. The last attempt was undertaken not long ago, and only a short time before his death. On that occasion twelve heifers were purchased by the Local Government Board and lodged in the Brown Institution, where they were inoculated by Dr. Klein, under the supervision and direction of Mr. Ceely; and though small-pox matter was literally poured into the incisions, and the greatest care was observed throughout, yet cow-pox was not developed in any of the animals. Similar failures have attended all other attempts, when these have been made openly and by two or more individuals. I may allude to those of the French commission, which included some of the most distinguished members of the medical profession in Paris, with the able veterinary surgeon, Chauveau, as operator; and the Italian commission, whose labors were carried on at Turin on a large scale and for a long time. All in vain, however, for small-pox could not be converted into cow-pox; and the conclusion arrived at was in direct opposition to that which Dr. Pavy asks us to accept.

Dr. Pavy speaks of the small-pox virus becoming attenuated in the cow, and that this attenuation manifests itself as cow-pox. But if inoculation of the former produces the latter, then I contend it is not attenuation, but absolute and perma-

nent transformation of the most startling and complete description, and such as cannot be effected with any virus or microbes known. We are required to believe that by one remove of human small-pox—a most infectious, fatal, and generally eruptive disease—to the cow, we have produced a non-fatal disease, which can only be transmitted by inoculation, with an eruption quite localized at the points of inoculation, and otherwise widely different in its clinical and pathological features, especially with regard to the eruption. Most astonishing of all, however, is the circumstance that this modified or attenuated small-pox, when carried back to its original soil in mankind, never resumes its original characteristics ; no matter though it be carried through countless generations of human beings, it remains forever in its transformed condition. This does not happen with an attenuated virus, nor can any virus, by any artifice of man, become so utterly changed. Again, we all know how readily vaccine lymph, when inoculated in the calf or cow, will produce vaccinia. As I have pointed out, all attempts to develop the latter by inoculating these animals with variolous matter have resulted in failure, when made by those most competent to achieve success, if this were possible.—*London Lancet.*

NATIONAL ADULTERATION BILL.

THE following is the text of the bill framed by the National Board of Trade, submitted to Congress, and which, it is again proposed, shall be made a law to prevent the adulteration of food or drugs :

Be it enacted, etc., That no person or corporation shall knowingly transport, or cause to be transported, from the State, District, or Territory in which he resides or does business into any other State or Territory, or from any foreign country, or other State or Territory, into the State or Territory in which he resides or does business, for sale or barter, or to be offered for sale or barter any article of food or drugs adulterated within the meaning of this act, and any person violating the above provisions shall be deemed guilty of a misdemeanor, and upon

conviction thereof shall be fined not more than fifty dollars for each offence.

SEC. 2. That no person shall, within the District of Columbia, or in any of the Territories, or in any fort, arsenal, dock-yard, or reservation, or other place under the jurisdiction of the United States, manufacture, offer for sale, or sell any article of food or drugs which is adulterated within the meaning of this act, and any person violating this provision shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding fifty dollars.

SEC. 3. If, on examination of any article of food or drugs, imported from any foreign country, it is found to be adulterated within the meaning of this act, a return to that effect shall be made upon the invoice, and articles so noted shall not be permitted to pass the custom house or be delivered to the consignees, unless on re-examination, as provided for in this act, it shall be found that the said articles are not adulterated.

SEC. 4. The owner or consignee shall have the privilege of calling at his own expense for a re-examination, and on depositing with the Collector of Customs such sum as he may deem sufficient to defray such expense, it shall be the duty of the Collector of Customs to procure a certificate, under oath from a public analyst, of a careful analysis of the articles in question ; and in case the report by certificate of the analyst shall declare the report of the officer who examined the goods to be erroneous and the said articles to be unadulterated, the said articles shall be returned to the owner or consignee, and passed without reservation on payment of the duties, if any. But in case the officer's return shall be sustained by the analyst, the said articles shall remain in charge of the Collector of Customs, to be disposed of in accordance with regulations to be prepared by the National Board of Health and approved by the Secretary of the Treasury ; *Provided,* That the owner or consignee, on payment of charges of storage and other expenses necessarily incurred by the United States, and on giving bond, with sureties satisfactory to the Collector agreeing to remove said articles from the United States, shall have the privilege of re-exporting them at any time within the period of six months after the date of the report of the inspector or public analyst.

SEC. 5. In order to carry into effect the provisions of this act, the Secretary of the Treasury is hereby authorized to appoint from names submitted to him for that purpose by the National Board of Health one or more suitably qualified persons as special inspectors and as public analysts for adulterated food and drugs at such ports of entry as the Secretary of the Treasury may deem expedient, and it shall be the duty of the National Board of Health to prepare instructions governing the work of such inspectors and analysts, which, when approved by the Secretary of the Treasury, shall govern their action, and that of collectors of customs, in preventing importation from foreign countries of food or drugs adulterated within the meaning of this act.

SEC. 6. The National Board of Health shall make, or cause to be made, examination of specimens of food and drugs collected under its direction in various parts of the country, and shall publish in its weekly bulletin the results of such analyses. If it shall appear from such examination that any of the provisions of this act have been violated, the Secretary of the Board shall at once report the facts to the proper United States District Attorney, with a copy of the results of the analyses duly authenticated by the analyst under oath.

SEC. 7. It shall be the duty of every District Attorney, to whom the Secretary of the National Board of Health or any Collector of Customs shall report any violation of this act, to cause proper proceedings to be commenced and prosecuted without delay for the fines and penalties in such case provided, unless, upon inquiry and examination, he shall decide that such proceedings cannot probably be sustained, in which case he shall report the facts to the National Board of Health And for the expenses incurred and services rendered in all such cases the District Attorney shall receive and be paid from the Treasury such sum as the Secretary of the Treasury shall deem just and reasonable, upon the certificate of the judge before whom such cases are tried or disposed.

SEC. 8. An article shall be deemed to be adulterated within the meaning of this Act—

a.—In the case of drugs.

1. If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality, or purity laid down therein.

2. If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or other standard work on Materia Medica, it differs materially from the standard or strength, quality or purity laid down in such work.

3. If its strength or purity fall below the professed standard under which it is sold.

b.—In the case of food or drink.

1. If any substance or substances has or have been mixed with it so as to reduce or lower or injuriously affect its quality or strength.

2. If any inferior or cheaper substance or substances have been substituted wholly or in part for the article.

3. If any valuable constituent of the article has been wholly or in part abstracted.

4. If it be an imitation of or be sold under the name of another article.

5. If it consists wholly or in part of a diseased or decomposed, or putrid or rotten animal or vegetable substance, whether manufactured or not, or in the case of milk, if it is the produce of a diseased animal.

6. If it be colored or coated, or polished or powdered, whereby damage is concealed, or it is made to appear better than it really is, or of greater value.

7. If it contain any added poisonous ingredient, or any ingredient which may render such article injurious to the health of a person consuming it : *Provided*, That the National Board of Health may, with the approval of the Secretary of the Treasury, from time to time declare certain articles or preparations to be exempt from the provisions of this act ; *And provided further*, That the provisions of this act shall not apply to mixtures or compounds *recognized* as ordinary articles of food, provided that the same are not injurious to health, and that the articles are distinctly labelled as a mixture, stating the components of the mixture.

SEC. 9. It shall be the duty of the National Board of Health to prepare and publish from time to time lists of the articles, mixtures, or compounds declared to be exempt from the provisions of this act in accordance with the preceding section. The National Board of Health shall also from time to time fix

the limits of variability permissible in any article or compound.

SEC. 10. The term "food" as used in this act shall include every article used for food or drink by man. The term "drug" as used in this act shall include all medicines for internal or external use.

SEC. 11. All the regulations and declarations of the National Board of Health, made under this act from time to time and promulgated, shall be printed in the Statutes at Large.

SEC. 12. This act shall take effect ninety days after it shall have become a law.

BRAZIL: MOVEMENTS OF THE POPULATION, THE CLIMATE, AND DISEASES OF THE CHIEF CITIES.

By T. P. CORBALLY, A.M., M.D.

THE Empire of Brazil forms a vast triangle, bounded on two sides by the Atlantic, while on the third it forms a part of the boundary of every country in South America except Chili. It occupies the greater part of the central and the whole of the eastern part of the southern continent, and embraces 3,000,000 square miles, or three sevenths of South America, and is greater in extent than the United States before the purchase of Alaska.

Many are under the impression that the dye-stuff known as brazil-wood takes its name from the country which produces it. The contrary is the fact. The country after its discovery was named Santa Cruz, or Vera Cruz, by Pedro Alvarez Cabral. Braza in Portuguese means a live coal or burning ember. This name was given to the wood for its color, and King Emanuel, of Portugal, gave the name to the country from which it was brought.*

Its natural productions—animal, mineral, and vegetable—are unsurpassed. Its rivers have no equal. The Amazon, or Maranhaô, with its hundreds of tributaries, drains half of the surface of the empire—a million and a half square miles; La Plata, with its tributaries, one fourth; and the Saô Francisco

* Lindley's Narrative of a Voyage to Brazil. Med. Rep., vol. 3.

the other fourth. The Brazilian Mountains traverse almost every section of the country south of the Amazon, forming elevated tracts, table-lands, and extensive plains—*silvas*—whose soil is so fertile that it is impossible to destroy vegetation.

The whites of more or less pure blood number between two and three millions, and the mixed races about twelve millions. The whites are divided into Brasileros and Europeos. The Azores and other Portuguese islands send some of the most hardy and useful colonists to the new empire. After the Portuguese the Germans are the most numerous immigrants ; then Spaniards, mostly Galicians and Catalans ; many Italians, French, Swiss, and English settlers, and a few Americans from the Southern States who have not generally been successful in regaining fortunes lost in the last war.

Germany sends every year thousands of hardy settlers, who till the land and develop the agricultural resources of the country. In former years most of the Europeans, especially the Germans, settled in the northern part of the empire, where they perished miserably, either from the severity of the climate or from malarial-fevers. Other causes of failure were the want of roads and the neglect to bring supplies for the colonists, and in many cases the dishonesty or the neglect of the companies under whose direction the colonists arrived, and, perhaps not the least, the hostility of the *fazendeiros*, who, it is said, number about six thousand and own one half of Brazil. This estimate would give each proprietor about two hundred and fifty square miles of land, a territory extending over hill and dale, forest and plain, beyond the reach even of the eagle's eye. Thus it has ever been that Europe has been drained of her hardy and industrious inhabitants in the vain attempts to establish permanent settlements within the tropical regions of the East and West Indies, of Asia, and of Africa. Since the tide of immigration has been directed to the southern provinces the rate of increase from foreign sources has been from two hundred to two hundred and fifty thousand yearly. It is estimated that from natural increase the population doubles every twenty-five to thirty years, because in the thickly settled districts the soil is fertile, the climate mild and healthy, and free from epidemics of yellow-

fever, which are severe only on the coast. If Brazil were as densely populated as Holland, or even as Great Britain, it would contain more than a thousand millions of inhabitants, which number it could easily support, for it has not a foot of desert, and the only portions of its surface withdrawn from cultivation would be the surface of its vast water-courses.

The country now realizes the fact that her wealth lies in her *fazendas*, covered with vines, plantations of tobacco, coffee, cotton, and sugar-cane ; her fields of grain, corn, and rice ; in her medicinal plants and dye-woods ; in a word, in all the productions of the temperate and tropical climates rather than in her mines, however rich. These will form the articles of future export, and will cause her commercial cities, as Rio de Janeiro, Bahia, Pernambuco, and others on the Atlantic, and great centres yet to be founded on her mighty rivers, to increase in population and in wealth. All her cities now in existence are on the coast, and form what might well be called the commercial zone.

Rio de Janeiro, the capital, is the largest city, not only in Brazil, but in South America. In THE SANITARIAN for November, 1882, the climatology, as well as the sanitary condition of the city at that time, was briefly described. An interesting article running through several numbers of the *União Medica* *—May to September—forming "A Comparative Study of the Sanitary Condition of the City from 1849 to 1884," by Sr. J. P. Favilla Nunez, gives occasion for some further remarks on its present and past sanitary condition.

Rio de Janeiro has an estimated population of 546,393. It is situated almost under the southern tropic, with the latitude of Jamaica but a much milder climate. A spacious channel affords a safe entrance to, perhaps, the finest harbor in the world, a small inland sea separated from the ocean by Mount Gavia and the lofty peaks of the Tijuaca, more than 2000 feet high, and the Corcovado, 3000 feet. It is more than one

* *União Medica*, Revista mensal consagrada a defesa dos interesses scientificos, moraes e profissionaes da classe medica. Redigida pelos Srs. Dr. Moncorvo, Professor de clinica de molestias das creanças na Policlinica, Dr. Silva Arauja, Professor de clinica de molestias da pelle e syphilis na Policlinica e Dr. Vieira de Mello, Redactor-Gerente. A União Medica forma enda anno um volume in 8° de 600 paginas. Redacção e Gerencia—57 Rua de Uruguay ana. Rio de Janeiro, 1885.

hundred miles in circumference, and without exaggeration would afford shelter to all the navies and merchant ships in both hemispheres. The city lies opposite the wooded peaks of the Corcovado and La Serra dos Orgaos. Rio ranks among the first commercial cities of the world, and fleets of merchant ships manned by tens of thousands of seamen enter and leave her port every year. It is regularly laid out, the streets are fine, and the dwellings magnificent in the wealthy part of the city, and will compare favorably with the finest capitals of the world ; while the parts occupied by the poor are filthy and neglected. In the suburbs and surrounding country are splendid villas and magnificent *characas*, or country-seats. A magnificent aqueduct supplies the city with an abundance of excellent water. Its climate is delightful, its situation picturesque, and its vegetable productions are such as those only who have travelled in tropical climates can imagine. It is remarkable for the great activity in its streets, and reminds the traveller of the commercial capitals of Europe.

An important feature of 1884 was the comparative freedom of the Atlantic cities from epidemics and the very few cases of yellow-fever. The deaths in Rio during 1884 were 9833, against 14,034 in the preceding year. During the 36 years from January, 1849, to December, 1884, there were 362,990 deaths, and the number during that year was the smallest since 1872, when the number was 10,338. In 1873 there were 15,382, the highest number during the thirteen years designated. In 1876 and 1878 there were, respectively, 14,175 and 14,509. It is one of the anomalies of climatology, as it is of sanitation in general, that the atmospheric conditions were more favorable for health during 1883 than during 1884. In the former year the range of the thermometer during the day was between 76° and 83° F., and 110 rainy days. During 1884 the temperature ranged between 74° and 85° F., and 95 rainy days. In 1883 February had the greatest number of rainy days, 16, and 1040 deaths ; in 1884 there were in the same month 5 rainy days and 894 deaths.

The mortality from febrile affection during the year 1884 was 1440 ; from yellow-fever, 618 ; from small-pox, 89 ; from pernicious-fever, 426 ; from typhoid-fever, 157 ; from measles, 15 ; and from bilious, malarial, intermittent remittent, puer-

peral, rheumatic, and other fevers, 135. In 1883 the deaths from this class of diseases was 3963, of which yellow-fever caused 1336, small-pox, 1366, and pernicious-fever, 600; other fevers, 661.

During the last twelve years there were only three in which the deaths from fevers were less than last year—1877, 1881, and 1882; in 1873 the number reached 3659, and in 1876, 3317. During the last twelve years yellow-fever caused 15,060 deaths, an average of 1255 for each year.

With the exception of 1880, the deaths from small-pox during 1884 were fewer than in any year for the last 20 years. In 1878 there were 2175 cases, and only 1174 from yellow-fever during the same year.

From 1870 to 1884 there were 8972 deaths from small-pox.

More recently an important and instructive brochure has been published by Dr. Favilla Nunes,* in which he treats: first, of the sanitary condition of Rio de Janeiro during the year 1884; secondly, of the outbreaks of yellow-fever in the fourteen years from the 1st of January, 1871, to December 31st, 1884; during which time the whole number of deaths was 15,338 from that disease, giving for each year 1095 deaths—3.68 deaths for every 1000 inhabitants. The third part reviews the mortality from fevers, epidemics, and the births and deaths during the years from 1875 to 1884. Deaths from these causes, 26,557, making 2655 for each year, or 8.9 deaths per 1000 inhabitants. The year showing the greatest mortality was 1878, in which the epidemic of small-pox was so very fatal.

The births during the last four decades, from 1845 to 1884, were 220,276; the number of vaccinations from 1873 to 1884 was 83,594, of which 18,856 were successful, 29,999 were without result, and in 34,739 the results were not ascertained.

The fourth and last part describes the sanitary condition of Rio de Janeiro in 1885. Tabulated statistics show the gratifying result that the number of deaths that year was much less than during any of the preceding years.

As in every country and in every variety of climate, phthisis causes a large proportion of the deaths. It is estimated that

* Dados estatisticos do estado Sanitario e serviças concernentes á salubridade publica da cidade do Rio de Janeiro, por Faviila Nunes—Rio de Janeiro, Imprensa Nacional, 1885, 1 vol. in 4° de 34 pp.

it has caused more deaths in Brazil during the last 36 years than all the epidemics combined, and including the various forms of phthisis, fully one fifth may be referred to that cause. Bringing only pulmonary phthisis into the consideration, the deaths will be about 16 per cent of the whole. The following table, giving percentage of deaths from phthisis pulmonalis in different cities, will prove exceedingly interesting to those engaged in this study :

Augsburg	9.6 per cent.
Stuttgart	11.0 "
Munich	12.8 "
Nuremberg	12.9 "
Leipzig	14.2 "
Dresden	14.4 "
Ratisbon	14.9 "
Frankfort-on-Main	15.3 "
Brussels	15.9 "
Rio de Janeiro	15.9 "
Bremen	17.4 "
Paris	17.7 "
Lille	19.9 "
Crefeld	20.8 "
Elberfeld	21.5 "
Vienna	24.9 "

In Rio, then, pulmonary phthisis causes about one sixth of the deaths, in Lille and Crefeld, one fifth, and in Vienna, 1 in 4. During the year 1884 there were 1799 deaths from this disease. In the last 14 years the whole number of deaths was 162,335, and 25,962 from phthisis pulmonalis, being an average of 1854 deaths yearly. It appears from the statistics that Rio is not among the most favored cities in regard to this disease, nor is it the greatest sufferer.

Statistics published by Vacher give the mortality from this disease in London as one eighth of all the deaths, New York as one seventh, Paris, one sixth, and Vienna, 1 in 4. Stark, however, put the deaths in London as 5.5 of the general mortality, and this statement has since been confirmed by Fonssagrives and Wunderlich ; and documents issued from the Register's Office give the relative mortality between 1838

and 1842 as more than 1 in 5 of the whole mortality. In 1881 Professor Arnauld stated that the mortality from phthisis in London, Paris, Vienna, Brussels, and Lille varied between 1 in 4 and 1 in 6 of the whole number of deaths.

In the four years from 1874 to 1877 there entered the port of Rio de Janeiro 13,558 vessels, of which number 4129 were propelled by steam and 9469 by sail. Of the steamships 2108 were Brazilian and 2021 foreign; of the sailing vessels 4129 were national and 4400 foreign. These ships were manned by 263,534 sailors, of whom 97,735 were natives and 165,799 were foreigners. During the same period 302,063 passengers entered the port, of whom 191,664 landed. Of these 116,474 were foreigners, which number gives an arrival averaging 29,118 foreigners every year.

From other tables it appears that the departures every year average less than one half of the arrivals who come to remain; and as the departures are mostly natives who intend to return, the rapid growth of the city is easily accounted for.

Bahia * is surrounded by the Reconcavo called the garden of Brazil, and is the most densely populated part of the empire. It was the capital before the seat of government was transferred to Rio de Janeiro, about the middle of the last century, and retains an appearance of venerable antiquity rarely met with in the New World. It is situated on the Bay of All Saints, which, after that of Rio, is the finest on the coast. The harbor is about 80 miles in circumference, and has a depth of about 200 feet of water. The channel which connects it with the ocean is of easy passage, and has a depth of from 20 to 40 metres—from 60 to 120 feet. The *Gazeta Medica* gives a report of the "Sanitary Condition of the City," treating mostly of yellow-fever, measles, and dysentery. In 1884, the winter, extending from April to November, was considered severe because the rain was copious and continuous; this was followed by a summer warm and dry, the thermometer

* *Gazeta Medica da Bahia*, publicada sob a direcção do Dr. A. Pacifico Pereira, Lente de Histologia da Facultade de Medicina da Bahia. Redactores, Dr. J. F. da Silva Lima; Dr. J. L. d'Almeida Couts; Dr. Ramiro Affonso Monteiro; Dr. M. Victorino Pereira; Dr. J. Remedios Monteiro-Gerente; Dr. P. P. da Costa Chastinet. Bahia, Litho-typographia de Joãs Gonçalves Tourinho-Arcas de Santa Barbara n. 83. Anno xvi., 1885.

sometimes reaching 31° C., or 89° F. The acute diseases of the respiratory organs, rheumatism, malarial and typhoid-fevers, were followed by months so free from sickness that the like has not occurred for years in the city ; even the *beriberi*, so common in the climate, was scarcely seen. Later, however, yellow-fever and measles began to appear. Yellow-fever did not make its first appearance, as on former occasions, among the seamen in the harbor coming from Rio de Janeiro. The cases which occurred between August and February of the year 1885 were only seven in number, and confined to two or three streets. Six of these were Spaniards or Italians as yet unacclimated, five were only two years and one seven in the country. Four of them died. One case, a girl born in Bahia, is said to have taken the disease from a companion of the same age (an Italian), who died on the 18th of January. This child's case was a mild one, but all the others were ushered in by the most severe symptoms—black vomit, anuria, etc. In the girl's case the anuria was not obstinate, and the jaundiced hue disappeared a few days after the subsidence of the fever. The case is presented to show the fact that, although a native may be exposed to the disease in its worst form, and even remain with the corpse after death, he either escapes or has the disease in a very mild form. The fact is not new, but it is considered proper to record it as supporting a theory already accepted that natives and children under 13 or 15 years of age are not by these circumstances alone fully protected against the disease. Soon after this two other fatal cases occurred, one a Portuguese, the other a Brazilian boy from the interior employed in a commercial house in the city. In March the hospital of Montserrat was prepared for the reception of fever patients either among the seamen or the poor of the city.

The inference from the facts given is that the year 1884 was a remarkably healthy one all along the Atlantic coast of South America. Diseases of all kinds, endemic and epidemic, were less frequent than they had been for years before, and this while the temperature was higher than the average. It also shows that natives born in the interior and coming to the coast are liable to take the disease and to die of it just as unacclimated foreigners. This remark is true not only of Brazil and of

yellow-fever, but of other countries and other diseases. Persons going from the elevated regions in the interior of Venezuela and Colombia to the low and marshy lands on the coast are as liable as foreigners to take the malarial-fevers which prevail during the hot months, and they prove fatal in a very large proportion of cases.

From the other commercial cities of Brazil, as Pernambuco, Belem, or Para, the reports are not given in detail, but they appear to have enjoyed, during the year 1884, the same immunity from disease as the larger commercial cities. It also seems that, if yellow-fever be excepted, the climate of South America is not more unhealthy than the northern half of the continent, while it is much milder and the soil richer and more productive.

Pará is the capital of the province or State of the same name, and was founded in 1616 by Francisco Caldeira do Castillo Branco, who named it Santa Maria do Belemdo graõ Pará, meaning Saint Mary of Bethlehem of the great sea. It has a fine harbor, formed partly by the long island of Onças, about two miles from the city, and by several smaller islands down the river. Ships of any size can lie within three or four hundred feet of the shore, and the landing is good. It is situated about eighty miles from the sea, on a point of land at the junction of the rivers Guama and Pará. Although but one degree south of the equator, the thermometer ranged, according to Herndon's tables, between 75½° and 85½° Fahrenheit, from the 12th of April, 1852, to the 7th of May, and light winds in the afternoon temper the heat of the sun.

It is a remarkably healthy city, with a population of between 40,000 and 50,000, and the deaths are only 48 per cent of the births. It was entirely free from epidemics until the year 1850, when the yellow-fever was brought by a vessel from Pernambuco. In the following year small-pox raged with great violence, and it has been estimated that during these two years fully 25 per cent of the inhabitants died. The harbor receives nearly all the refuse of the city, both animal and vegetable, and the slips are partly filled with organic matter, which is exposed at low tide and rapidly decomposed by the rays of a tropical sun. It forms a delightful place of residence. All the houses have gardens, in which are seen the palm, the cocoa-

nut, the cinnamon, the bread-fruit-tree, and rich green vines of black pepper.

In 1852 Lieutenant Herndon ("Exploration of the Valley of the Amazon") found the primary schools in the province comparatively few; the cost of each child to the Government was about seven and a half dollars. In the Latin schools about one person in every five hundred was educated at a cost of twenty-six dollars, and "in the College of Pará, called the '*Lyceo da Capital*,' the proportion educated was one to two hundred and eleven, at a cost of sixty-two dollars." He also found "two capital institutions of instruction in Pará, one for the education of poor boys as mechanics, who are compelled to pay for their education in labor for the State, and the other for the instruction in the practical business of life of orphan and destitute girls." "The police," he says, "is excellent, but except to take up a drunken foreign sailor occasionally, it has nothing to do. Crime, such as violence, stealing, drunkenness, etc., is very rare in Pará. Probably the people are too lazy to be bad."

The city is supplied with beef from the island of Marajo, which is situated between the Amazon and the Pará. It contains about 10,000 square miles, and is greater in extent than any of our Eastern States except Maine, and is equal to the united areas of New Jersey and Delaware. Cattle were brought there in 1644 from the Cape de Verde Islands, and they increased to such an extent that they became a source of great revenue to the Government.

About the year 1824 a terrible and destructive disease broke out among the horses on the island. Previous to that time a good horse could be bought for a dollar, but now the people have to depend on the provinces for their supply. Many theories have been formed and different opinions expressed regarding the origin of the disease. Some say that the disease was brought down the river from Santarem and Lago Grande; that it appeared first among the dogs, then attacked the *capinaras*, or river hogs, and the alligators, and finally the horses. Another account attributes the disease to a wanton destruction of the animals, several thousands of them having been killed and the carcasses left to decompose on the plains, thus poisoning the animals that grazed on it. The disease

has since extended to other islands, so that it seems to be infectious.

Pará is noted for the exportation of rubber and the dyestuff called annatto.

The word Pará, in the Quechua, which embraces the languages spoken on the Pacific slope of the Andes, particularly in Peru and Bolivia, is the generic term for water, as *atl* is among the Aztecs of Mexico and Central America. Strictly, in Quechua, it means rain, and in a more general sense is applied to the sea or to any large collection of water. Parani means to rain. Paria is the name of an ancient province in Bolivia and also of a lake connected by an outlet with Lake Titicaca. Paria is also the name of a gulf between the Island of Trinidad and the mouths of the Orinoco.

In the Guarani, the language used along the Atlantic and in all the territory watered by the great streams that flow to the east and their tributaries, Pará means the *sea;* Parai is sea water. It is found in the names of rivers as the Parana, parent or source of the sea; Para-gua-y, a great mass of water; Paranagua, the ancient name of the Rio Janeiro. Pará is found in the names of cities and nations bordering on the great rivers. Pará is itself the name of a province, of its capital city, and the river on which it is situated. The name has, in many cases, been entirely dropped; thus the Amazon was by the natives called Parana and the Orinoco Paraguá. The Rio de la Plata, or Silver River, was Para-gua-çu, a vast body of water. In other cases it has been obscured by etymological changes, thus: Para-sil was the ancient name of Brazil, Pernambuco was Para-nambu. The Caribes called the Hollanders who settled Dutch Guiana, Para-machire, inhabitants of the sea; and the capital of the country Para-maribo.

Thus etymology traces the progress of emigration in the Quechua from Peru to the Rio de la Plata; in the Guarani language through Brazil; in the Tupi through the country north of the Orinoco, and finally, in the Carib dialects to the West Indies. It is a remarkable fact that the Guarani is today the language of the people of Uruguay; it is the language of society, the language of business, and the language of the schools, and those who have spent years among the people assure us that almost every one reads and writes.

The Parias or Pariagotos were, according to Irving, the first people whom Columbus met in 1498 on the Western Continent; they called the country Paria. Among the Caribs of the West Indies the word undergoes many changes; thus in Haiti it was Bagua or Vagua. Did the Caribs come originally from Peru and in course of time lose their original civilization?

EDITOR'S TABLE.

An open letter to the editor from Dr. Charles Denison, of Denver, on "Consumption in Colorado," published in the Denver *Republican*, was received too late for attention in this number. Besides which, a sprained wrist has deferred other editorial matter and delayed this issue.

MORTALITY AND MORBILITY STATISTICS AT MOST RECENT DATES.

Connecticut.—The total number of deaths registered in the cities of Connecticut during November was 405, as against 403 in the month of October. The annual death-rate in the cities was 16.3 per 1000 of the population. It is safe to say from the reports received that the mortality throughout the State was not greater than in the cities thereof.

There were no deaths in November from scarlet-fever or measles in any of the cities of Connecticut, and only 7 deaths from typhoid-fever in all the ten cities.

New Haven reports for November, in a population estimated at 80,000, 99 deaths, of which 17 were from zymotic diseases and 15 from consumption. The annual death-rate for the month was 14.8. There were 29 deaths of children under five years of age.

Bridgeport.—More sickness than in preceding month or in same month of previous years.

Durham.—Less sickness than usual for several months. No epidemic.

Griswold.—Sickness somewhat more than the average in the autumn. There is no epidemic except whooping-cough among the children.

Hartford.—About as much sickness as in October, and rather more than corresponding months of previous years. Still, there is no epidemic and no special disease prevailing.

Madison.—Less sickness than in last month, and less than in Novembers of previous years.

Meriden.—More of our people sick than usual. Influenza almost epidemic.

Norwalk.—More sick than in the preceding month, but about the same number as usual in November. There is no epidemic.

Salem.—Less sickness than usual for the season. There is only bronchitis, rheumatism, and neuralgia to prescribe for.

Tolland.—There is more sickness than common this autumn. Typhoid-fever is prevalent.

Westport.—More than the customary amount of sickness for the season. Pneumonia, remittent-fever, scarlet-fever, and diphtheria prevail, but not enough of either to be called epidemic.

Waterbury.—The mortality is somewhat greater than for the corresponding month last year, but is less than that of last month. Diphtheria is the only epidemic disease prevailing, and the cases are not proving fatal, as shown by only one death for the month. Typhoid-fever has not prevailed to any great extent. There was one fatal.

Wethersfield.—About the average health. There are some malarial troubles and influenzas, but they are neither frequent nor severe.

Windham.—The prevailing affections are light in character, chiefly catarrhal inflammations of the mucous surfaces. There are malarial-fevers, with some cases of typhoid, and also muscular and acute rheumatism. Among children there are mild cases of diphtheria and scarlet-fever, but none fatal.

In public institutions there were 11 deaths in New Haven, 13 in Hartford, and 4 in Middletown. Deducting these from the full number reported gives the following as the annual death-rate for the cities: New Haven 13.2, Hartford 18.5, Bridgeport 14.7, Waterbury 15.2, Norwich 16.6, Meriden 9.9, New Britain 12.9, Norwalk 18.6, Middletown 22, New London 14.

The state of health in general throughout the common-

wealth does not appear to be much changed since the last report. No violent epidemics are reported from any part of the State.

DELAWARE.—*Wilmington* reports 74 deaths during November in a population of 55,800, of which 9 were from zymotic diseases and 15 from consumption. The death rate per 1000 is shown to be 15.91. There were 40 deaths of children under five years of age.

ILLINOIS.—Quarterly meeting, October 28th–29th, the Secretary reported the same generally satisfactory condition of the public health noted at the close of the last quarter. Many cases of water pollution hitherto unsuspected—notwithstanding the frequent illnesses of those using the water—have been revealed by the house-to-house inspections and the conditions thence disclosed. Analyses of waters thus brought under suspicion have frequently led to examinations which resulted in discovering sewage and other contamination. No more important sanitary duty now devolves upon the Board than this. Diphtheria has appeared at several places, and at Streator and vicinity proved quite fatal. A mild type of scarlet-fever still continues to occur. There is no small-pox in the State, and with the exceptions noted, the quarter has been unusually healthy.

The disposal of Chicago sewage with reference to the sanitary questions involved in the condition of the Chicago River and the Illinois and Michigan Canal, to the water-supply of Chicago and suburban towns, and to the potability of the water of the Illinois River, continues to be a subject of deep concern to the Secretary, as it has been for many years. From a series of recorded weekly observations of meteorological conditions affecting the water-supply, from September 5th, 1865, to August 28th, 1886, he is led to repeat the following conclusion, which he first reported in 1879, and which subsequent observation has corroborated.

"After a careful investigation I am satisfied that with 50,000 cubic feet of water passing into the head of the canal per minute, the (Chicago) main river and south branch will be purified; no nuisance will result from sewage at Joliet and

below, and the potability of the water in the Illinois River at Peoria will not be in the least affected from that source. An increase of water to 60,000 cubic feet per minute would, in my opinion, take in addition the sewage of the north branch after it has once been cleaned out, and would diminish the nuisance in the south fork of the south branch at least three fourths."

Chicago reports 1077 deaths during November in a population of 704,000, showing a death rate of 18.36 per 1000. There were 443 deaths of children under five years of age. From zymotic diseases there were 328 deaths, and from consumption 85.

Rock Island reports 10 deaths during the four weeks ending November 27th, of which 5 were of children under five years of age. There were 2 deaths from consumption and 2 from zymotic diseases. The annual rate per 1000 was 9.05, population being estimated at 13,655.

LOUISIANA.—*New Orleans* reports for November 536 deaths —of which 176 were colored—in a population of 238,000—173,500 white and 64,500 colored—showing the respective death rates to be 24.89 and 32.74, and for the whole city, 27.02. There were 202 deaths of children under five years of age. The deaths from zymotic diseases numbered 77 and from consumption, 59.

MAINE.—*Contagious and Parasitic Diseases of Animals.*—Appreciating the importance of the prompt recognition of animal diseases, the State Board of Health of Maine has issued a circular, giving a concise description of the symptoms of those diseases which are most to be feared, for distribution among persons in the State who have the care of stock, or who are otherwise interested in the prevention of such diseases. Copies may be obtained by addressing the secretary of the board, Augusta, Me.

MARYLAND.—*Baltimore*—population 355,770—reports for four weeks ending November 27th, 527 deaths, of which 108 were from zymotic causes and 88 from consumption. Annual rate per 1000, 16.37. There were 191 deaths of children under five years of age.

MICHIGAN.—For the month of November, 1886, compared with the preceding month, the reports indicate that bronchitis, pneumonia, and influenza increased, and that diarrhœa, cholera-infantum, and cholera-morbus decreased in prevalence.

Compared with the preceding month, the temperature in the month of November, 1886, was much lower, the absolute humidity and the night ozone were less, the relative humidity and the day ozone were slightly more.

Compared with the average for the month of November in the eight years 1879–86, intermittent-fever, pneumonia, typho-malarial-fever, remittent-fever, and diphtheria were less prevalent in November, 1886.

For the month of November, 1886, compared with the average of corresponding months for the eight years 1879–86, the temperature was lower, the absolute humidity was less, the relative humidity was the same, the day and the night ozone were more.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of November, 1886, at 63 places, scarlet-fever at 42 places, typhoid-fever at 35 places, measles at 11 places, and small-pox at 1 place.

Reports from all sources show diphtheria reported at the same number of places, scarlet-fever at 4 places more, typhoid-fever at 8 places less, measles at 5 places more, and small-pox at the same number of places in November, 1886, as in the preceding month.

Detroit reports for November 274 deaths in a population estimated at 175,000, representing an annual death rate of 19.04 per 1000. There were 73 deaths from zymotic diseases and 25 from consumption. Forty-eight deaths were of children under five years of age.

The Sanitary Convention at Big Rapids, under the auspices of the State Board of Health, November 18th and 19th, was opened by an address of welcome by the mayor of the city, E. W. Hudnutt. Dr. John Avery, of Greenville, President of the State Board, spoke in response to the address of welcome, and said that the object of the Convention was not to benefit physicians, but the public. The members of the State Board of Health also wished to gain information, that they may

better serve the people. Rev. Henry Johnson, President of the Convention, read an able address.

Dr. John P. Stoddard, of Muskegon, read a paper on "Injuries of Every-day Drug-Taking." He attributed the practice in a great degree to the habit of mothers dosing their babies with "soothing syrup," "hive syrup," etc. The prevention was to educate the people in the injurious effects. There should be less medicine taken, and none given except by the advice of a physician.

Dr. David Inglis, of Detroit, read a paper entitled "Alcohol: What Effect has it as Food, Medicine, or Poison?" He urged that whatever might be admitted in regard to the use of alcohol in extreme cases, in disease, we ought, in all cases, to let alcoholic liquors be the last, and not the first, remedy; that we ought to give alcohol in definite and known doses, and only during such time as the drug is required, and to make it our business to see that its use is then suspended, just as we do in the use of opium.

Dr. J. L. Burkart, of Big Rapids, read a paper on "Water-Supply of Big Rapids." The paper embodied the report of the committee appointed by the Common Council to investigate the matter of procuring a better article of water for that city, and contained much of special interest to the citizens of Big Rapids.

This was followed by a paper on "The Sanitary Needs of Big Rapids," by Dr. L. S. Griswold, which contained practical suggestions for the citizens of that city.

Professor W. N. Ferris, of the Big Rapids Industrial School, read a paper on "Hygiene of Schools." He said that he could not recall ever having visited a room regularly occupied by forty or fifty pupils that could be said to be properly ventilated. Dulness, nervousness, headache, colds, catarrh, and consumption are among the frequent effects of staying in such rooms. Strange as it may seem, school patrons think very little about ventilation, and care less. Vitiated air is the most expensive commodity which man takes into his body; for in thousands of families the expenditure of money for a single year which sickness and loss of time occasion by inhaling poison would defray the necessary expenses for properly ventilating a decently constructed house. He also denounced the style of

desks in use in one school-room in Big Rapids as "torture appliances."

Colonel J. O. Hudnutt, C.E., of Big Rapids, read a paper on "A System of Sewerage and Drainage for Big Rapids."

Judge M. Brown, of Big Rapids, read a paper on "Public Health Laws." After referring to the health regulations of the ancients, he said: "As civilization has advanced, and the average of mankind has reached a higher condition upon the plane of intelligence, health laws have become more general and better enforced. It may be stated as a fact that the race of man has advanced mentally and physically in proportion as heed has been given to the laws for the promotion of health." He discussed English sanitary work, and in comparison thought the laws of Michigan in regard to public health were good enough, but the way they are usually enforced very bad. "In this county, until a very recent date, at every term of the circuit court more or less people in attendance became sick. Court was held in a room entirely unfit for occupancy, on account of not being properly ventilated. . . . I desire to call attention to the subject of prisons and jails in this part of the State. I don't know a jail within the Ninth Congressional District that is properly ventilated, and hardly one that is proper for a human being to remain in over night. This subject has been agitated and investigated by the State Board of Health and the State Board of Correction and Charities, and a great deal of valuable work has been done; but there is still very much to do."

Dr. Arthur Hazlewood, of Grand Rapids, a member of the State Board of Health, addressed the Convention on the subject of "What to Eat, When, and How." Dr. R. J. Kirkland, also of Grand Rapids, read a paper on "Care of the Eyes." Both of these papers were interesting, but we have not been able to secure abstracts.

"Surface Filth as a Medium of Disease" was the subject of a paper by Rev. Henry A. Wales, of Big Rapids. He said: "In 1876 Dr. Henry Bowditch, of Boston, made an estimate of the annual cost to the people of the United States because of unnecessary sickness, and placed the figures at $100,000,000. Later, one of our own physicians—who is with us to-day—revised these estimates, going more into detail, and he increased

the amount to $300,000,000; a loss each year of over $10,000,000 to the people of Michigan. And this estimate leaves out of view the physical suffering, the mental pain and anguish, and the death of loved ones around our social circles." In regard to filth he said: "By surface filth, we mean anything of this disgusting nature that is thrown upon or is suffered to lie upon the surface of the ground around our habitations or places of business—garbage, or the refuse of vegetable and animal matter; dirty water of every description, from that in which food is cleansed to the dish-water and slops of a household; dirt swept from the floors of the home or shop; the contents of the wood-box and spittoons; the refuse of a wood-yard, hen-house, or pig-pen; and the excrement from chambers and privies. Besides these, there are sources of filth in musty rooms, woollen blankets, feather beds, and the cellars under the house. Rubbish of any kind always becomes filthy if allowed to stand; and dampness increases filth, by causing fermentation and vegetable growth. . . . A close inspection of all the premises of a habitation is continuously needed, that nothing which may cause filth shall be allowed to accumulate." Mr. Wales thought that the "grand march of the giant contagion begins in the surface filth and the vaults of the civilized privy;" and he thought that if the dry-earth system were universally introduced, it would exterminate such diseases as cholera, dysentery, and typhoid-fever, as they are propagated solely by germs in the voided excrement.

Professor Henry F. Lyster, M.D., of Detroit, a member of the State Board of Health, read a paper for which no subject was announced. He said: "Nature cares absolutely nothing for individuals. It is the family, the species, the race that she cares for. When one of her laws has been contravened, it may not always be capital punishment, but it will always be punishment proportionate to the offence. She is implacable as long as the law is offended. She asks no reasons; she demands no explanations. She simply requires obedience. The more we study and understand her laws, the more clearly appears a divine will governing them. An offence against the moral law of our nature brings its punishment in the deterioration of our moral nature just so long as it continues. . . . If you should go through the wards of St. Mary's or Harper's

hospitals, you would see lying upon one of the beds a poor, wan consumptive, with a dash of too much brilliancy in his eyes, too long eyelashes, a too delicately chiselled nose, too bright a crimson spot upon the cheeks, too hot and pungent a feeling to the long, thin hands. It may be from no fault or error of his own that he lies there. He is bearing the punishment to which nature, in her own unerring judgment, has set her seal. In this ward you might see a young man old before his time, whose uncertain, shuffling gait and feeble form have placed him, physically, among the octogenarians, and whose waning intellectual power and dull, sluggish brain fail to respond to any emotion of either joy or sorrow. Here is the victim of dissipation and intemperance. Nature is punishing him. The laws which he infringed years ago are unsatisfied. He has wrecked his own life, and who knows what other lives? He passed his rubicon in early manhood. He will make his final ferryage before he should have reached the youth of his strength. There is a beautiful little girl. Some deformity of the spine has been her lot. . . . She is suffering for the sins of her forefathers. Thus we see, on all sides, the victims of the infringement of natural laws. . . . While the germs and species will be preserved in nature, what can be done to save the individual and enable him to attain his highest degree of perfection, physically and mentally? It is here that a distinct science is applied, known as sanitary science. The discoveries in this science are nothing more than translation and application of natural laws to the preservation of health and the prolongation of life. . . . A young man is in no way responsible for his inheritances, but sanitary science can teach him much that will profit him, and can do much to protect him. Suppose that his father had died at thirty of consumption, and that his mother at forty was in feeble health, very nervous and a victim of various neuralgias, and came from a comparatively short-lived family. Sanitary science would say to this young man, Choose your occupation from among those which will enable you to be in the open air a large portion of the time; where exercise would insure good sleep at night; where good 'digestion waits on appetite, and health on both.' He should prefer the saddle to the office desk, the broad fields of the farm and the smell of the new-mown hay to the narrow streets and

the lowering cloud of smoke and dust that hangs over the crowded city. He should turn his back upon the tempting offer of a clerkship in an insurance office or store, and herd sheep in New Mexico, cattle in Montana, or manufacture pine lumber in Northern Michigan or farm it in Washtenaw or Oakland County. Let him do anything under the sun rather than inure himself in the shadow of indoor life."

Dr. John Avery, of Greenville, President of the State Board of Health, read a paper on the subject of "Pasteur and Protective Medicine." He told of Pasteur's parentage, his boyhood, his studies, and his first triumph as a chemist in discovering the left-handed polarizing tartaric acid. "Pasteur, after this work, was made assistant professor of chemistry at Strasburg, where his first work was to prove the power of minute organisms to change or modify chemical affinity. He was then made dean of the faculty of science at Lille. Here he determined to devote a portion of his lectures to the study of fermentation. The prevailing theory of fermentation at this time Pasteur could not accept. He experimented with milk, and discovered the lactic ferment. And soon after, in the same substance or some of its products, he found the butyric ferment. These two organisms he found to be entirely distinct. The lactic ferment required for its existence and multiplication free oxygen or air; while the butyric ferment died when exposed to the atmosphere. Pasteur soon demonstrated that the special fermentation known as putrefaction is caused by a living organism belonging to the same class as the butyric ferment; and he also soon discovered the ascetic acid ferment —the '*mycoderma aceti.*' Pasteur's next work was to demonstrate that spontaneous generation was a myth; and he then discovered the germ which caused so much havoc among the silk-worms of France and other countries. He demonstrated that the disease among the silk-worms was contagious, and gave practical directions for its prevention, which restored the silk industry to Europe. This work led him to the great work of his life—the development of the theory of the parasitic origin of communicable diseases; and in this effort he took up the disease known as anthrax or splenic-fever, which was decimating the flocks of all Europe. He put a drop of splenic-fever blood into sterilized yeast water; in a few hours

it swarmed with myriads of bacteria. A drop of the first cultivation he put into a second flask containing the same kind of liquid, and the bacteria multiplied as before. This process he repeated fifteen or twenty times, and by this means freed the initial drop of blood from any substance it might have carried with it. And now, if a drop of this last cultivation is injected under the skin of a rabbit or a sheep, the animal dies with all the symptoms of idiopathic splenic-fever. Pasteur had studied vaccination, and he now undertook to 'vaccinate,' for protection of animals against splenic-fever. Before the close of the year 1881 Pasteur had 'vaccinated' 33,946 animals. In 1882 the number amounted to 399,102, including 47,000 oxen and 2000 horses. In 1883 100,000 were added to the list. In 1881 it was the common practice of farmers to 'vaccinate' one half of their herds and leave the other half unprotected. It was found at the close of the year that the loss in the protected sheep was 10 times less than in the unprotected, being 1 in 740 as against 1 in 78. In cows and oxen it was 14 times less. . . . In pursuing his investigations of the splenic-fever disease, Pasteur made some curious and interesting discoveries which are of practical value to sanitarians and all who are interested in preventing the spread of communicable diseases. . . . He found that an attenuated virus that could cause no harm to a guinea pig of a year or a month or even a week old, would kill one just born. The weakened microbe could multiply itself in the blood of one so young; and a few drops of this pig's blood would kill one still older, and so on until the full virulence of the microbe was restored. . . . Exposed to the air, these germs become weakened or take on the form of spores, in which condition they will remain viable for years, and float in the air as minute particles of dust, until they find lodgment in the proper media for their development and multiplication. What is true of these germs may also be true of the germs of diphtheria, scarlet-fever, small-pox, typhoid-fever, and other communicable diseases. In localities where these diseases have prevailed as epidemics, is it not quite possible their attenuated and viable germs are constantly floating in the air, ready to resume their active form whenever and wherever the conditions of climate, of poverty, of wretchedness, of filth, and of bad air present them-

selves?" Dr. Avery closed his paper with a discussion of Pasteur's work in inoculating for hydrophobia.

The last paper of the convention was on "Prevention of Communicable Diseases," by Dr. F. Gundrum, of Ionia, of which no abstract has been obtained.

Sets of the pamphlets issued by the State Board of Health, giving detailed methods for the restriction and prevention of each of the dangerous communicable diseases, were distributed in the audience. The convention was a successful one, and will doubtless result in good to that community.

MINNESOTA *Bulletin* for November reports infectious diseases: *Diphtheria*, 46 cases, 11 deaths; *scarlatina*, 11 cases. *Diseases of animals:* Cases of glanders remaining on hand, isolated or not accounted for at first of month, 20; reported during the month, 16; killed, 12; released, 9; isolated, 10. Remaining November 1st, isolated or not accounted for, 15.

St. Paul reports in its population of 125,000, 159 deaths during November, making the annual death rate 15.26 per 1000. There were 88 deaths of children under five years of age. From zymotic diseases there were 57 deaths and from consumption, 12. Owing to the prevalence of diphtheria, the Department of Health, under date of December 9th, issued a special circular, admonishing the people against public funerals and other means of propagating the disease, and urging upon physicians and others prompt and restrictive measures in every case.

Annual report for the year ending October 31st, 1886, shows an unusual prevalence of diphtheria and scarlet-fever throughout the year. There were of the former 365 cases, with 94 deaths; and of the latter, 425 cases, with 49 deaths. Of deaths from other zymotic diseases there were from croup, 50; gastro-intestinal and diarrhœal diseases, 277; typhoid-fever, 68; puerperal-fever, 28. And from other leading causes: Phthisis, 115; tuberculosis, 25; pneumonia, 97. Total from all causes, 1519; of which 798 were of children under five years of age. Yet the annual death rate, based upon an estimated population of 125,000 (nearly trebled since 1880), was but 12.15 per 1000.

Of 365 cases of diphtheria, the supposed origin of which was

investigated, 328 occurred in houses having no sewer connections, and but 37 in houses connected with the public sewers; and of the 425 cases of scarlet-fever investigated with reference to this point, 333 occurred in houses without sewer connections, and but 92 occurred in houses connected with the public sewers. The health officer again urges progress in sewerage, as he did in the report for 1885; and says of the drinking water: "Many analyses have been made for the Department of Health, by a thoroughly competent chemist, of specimens of well water taken from almost every section of the city; and, in the vast majority of instances, the impurity of such water has been shown beyond a doubt. . . . Three fourths of our population continue to drink the contaminated water of wells, in spite of all warnings, instead of the lake water, which is as pure as that supplying any city in the United States."

That there should be a very large percentage of deaths from zymotic diseases under such circumstances is not surprising; but it *is* surprising that with such a large proportion from preventable causes, the rate of mortality is so small. It can be accounted for by a probable overestimate of population.

Minneapolis, with an estimated population of 129,200, reports for the month of November: Deaths, 192; under five years, 77; from zymotic diseases, 73, or 38 per cent of all causes. The prevailing zymotic diseases and the number of deaths therefrom were: Diphtheria and croup, 46; typhoid-fever, 18. From consumption there were 20 deaths; from other respiratory diseases, 35. Death rate, 17.72.

MISSOURI.—*St. Louis* reports during November 701 deaths in a population of 400,000, of which 239 were from zymotic diseases and 72 from consumption. Two hundred and eighty-nine deaths were of children under five years of age. The annual death rate was 21.03.

NEW JERSEY.—*Hudson County*, population 250,000, reports for November 447 deaths, of which 167 were under five years of age. Annual rate per 1000 21.4. There were 86 deaths from zymotic diseases and 60 from consumption.

Newark reports for November 270 deaths in a population of 159,872, of which 61 were from zymotic diseases and 41 from

consumption. There were 101 deaths among children under five years of age. The annual rate per 1000 was 20.25.

Paterson reports 103 deaths during November, of which 37 were under five years of age. There were 46 deaths from zymotic diseases and 16 from consumption.

The New Jersey Sanitary Association held its twelfth annual meeting at Trenton, November 19th and 20th. Professor James M. Green, of Long Branch, the President, called it to order. Dr. D. C. English, of New Brunswick, the Recording Secretary, read a report of the preceding meeting, a year ago, and the doings of the Executive Council since. The local Committee of Arrangements, consisting of Drs. H. G. Wetherill and C. Shepherd, with Professor Hasbrouck, of the State Schools, extended a cordial welcome to the Association through the first-named gentleman, who, referring incidentally to the sanitary condition of the city of Trenton, described the struggle going on there for a system of sewerage. President Green replied appropriately to the remarks of welcome, whereupon a paper prepared by J. C. Bayles, M.E., of Orange, on "Trap Ventilation and the Fresh-Air Inlets Thereto," was read by George P. Olcott, C.E., of East Orange.

The trap was stated to be simply a bend or enlargement of a waste-pipe so arranged as to hold a small quantity of water. The function of this water is to close a branch waste against the free passage of air currents. If more than this is expected of a trap, it is sure to disappoint the expectation. The more complex the structure of a trap, with a view to making it secure against influences tending to empty it, the greater the certainty that it will become a conservator of filth and in itself a nuisance. The writer's observation and experience led him to believe that the simplest form of trap, the "S" and "half-S," adequately vented from the crown of the bend, is the best, all things considered. A vent as large as the trapped pipe is adequate under all conditions. Traps are sometimes placed in positions which render vents of doubtful value. The venting of traps has a double purpose. It is intended to save the seals, which are liable to displacement by the creation of a partial vacuum in the waste-pipe system beyond them, making a demand for air which, if supplied through the trap, carries enough water out to leave it unsealed. It is also intended

to afford an outlet for foul air which might otherwise accumulate in the branch waste below the trap, and finally pass its seal by the well-known process of the absorption and release of gases by water. When the objections to the trap vent are analyzed, they will be found to be advanced in the interest of patented traps. Commercial considerations underlie most of the current literature of mechanical hygiene. A large part of the inventions which are crowded upon the public notice are made, not because they are needed, but because by persistent advertising they can be made a source of profit. Most of them originate with persons ignorant of the practical problems encountered in plumbing, and who seek to remedy difficulties which exist only in imagination. Traps to "exclude" sewer gas belong to this class of inventions. Those who make them are either ignorant of the fact that in good practice the attempt to bottle up bad air in pipes has long been abandoned, and that progress tends steadily in the direction of multiplying easy and safe outlets for it; or else they disregard this fact on the assumption that people who have not given the subject intelligent attention are still laboring under the delusion that it is possible or desirable to exclude sewer gas by mechanical means. Having examined on the average seven new traps a week for the past ten years, the writer does not hesitate to put it on record as his opinion that the simplest trap is the best, and that any complication introduced in its construction tends to impair its value. . . . A house drain should not be trapped. A good many believe that the householder should interpose a trap between his house and the public sewer. A trap of any form there will retard the sewage flow and create worse conditions than those sought to be escaped from.

The radical views expressed by Mr. Bayles against the trapping of house drains were, on the conclusion of the paper, followed by a lively discussion, begun by Mr. Olcott, the reader. Dr. Ezra M. Hunt, Dr. W. K. Newton, J. C. Pumpelly, and Civil Engineer C. P. Bassett all participated and agreed that simple plumbing was the best, but differed from Mr. Bayles on the main point in the paper—namely, that the "house drain should not be trapped."

The next paper read was on "Disposal of House Sewage in Districts not Provided with Sewers," by C. P. Bassett, C.E.,

of Newark. Alluding to the several methods adopted to dispose of sewage where there are no sewers, he stated that no condemnation could be too sweeping to properly characterize the privy vault and cesspool as generally constructed. He advocated the movable pail system as an improvement. In Birmingham, England, 40,000 pails, representing over 250,000 people, are collected weekly and carried to the dumping station, where the contents are placed in a tank, treated with sulphuric acid, dried, and bagged for sale. The net cost to the authorities is less than ten cents a head per year. Another method of removal which has met with success under certain conditions is the dry-earth closet. But this system cannot secure wide popularity. A proper supply of earth, prompt covering of the deposit, removal of the compost and ventilation of the closet, are among the requisites difficult of procurement. It is suggested that where dry removal is not possible, the problem may be solved, if town authorities will introduce and enforce a system of water-tight, ventilated vaults with a proper pneumatic *system of removal entirely under the control of the authorities,* wherever the "sub-irrigation system" is not introduced.

"The Work of the Plumber and the Modes of Conveying and Disposing of Sewage," by J. J. Powers, C.E., may be found in full on other pages of this number. Other papers more or less relating to the same subject were: "The Physical Laws of Pipes and Fixtures and their Contents," by Professor C. F. Brackett, President of the State Board of Health, and "The Duties of Local Inspectors, How best Performed and Details of Method," by Henry Mitchell, M.D. Dr. E. M. Hunt, Secretary of the State Board of Health, made some remarks on "The work of the present and the immediate future for New Jersey Health Boards." He dwelt upon the necessity for the diffusion of information by the local boards of health, and the importance of care as to judicial action. More can be accomplished with good law, judiciously applied, than in any other manner. He thought the State Board should have increased powers, that it might better be able to compel local boards to do their duty in cases where they neglect it.

The annual address by the President, Dr. Green, dwelt chiefly upon school hygiene—the importance of practical

physiological knowledge by teachers, and the requisites of school-house sanitation. This subject was intensified by Professor Charles Jacobus, of New Brunswick, who read a paper on "Physical Restraint and Relaxation in the School-room." He considered first, restraint—its nature, disadvantages, and benefits—and described it, referring particularly to the rigid restraint of the school-room. Relaxation, he said, should be introduced in the school-room in the way of physicial exercise, such as calisthenics. The uniform and systematic methods of Germany in joining physical with mental culture were alluded to. The system has resulted in making of Germany the foremost country of the continent. The first need in this country is more room for the scholars.

The paper was a deeply interesting one throughout. On its conclusion Professor J. Madison Watson remarked, in substance, that physical restraint in the school-room was abnormal and should be exceptional. Any education that does not involve the mental as well as the physical, that does not secure harmony of the powers, bodily and mental, is faulty. Professor Watson described several physical exercises, including phonetics, and recommended them as invaluable to secure the benefits desired.

Dr. Shippen Wallace, of Burlington, read a paper on "Preserved Foods," which he defended very ardently as healthy foods, despite the numerous assaults upon them in the newspapers. He made the assertion that there is not on record a well-authenticated case of poisoning or death from the use of canned food, that was sound at the time it was consumed. Death recently resulted in a case where the victim had eaten putrid salmon. It is such cases as that which have created the impression in the public mind that some legislation is necessary for the protection of the public health, when it is safe to say that far more sickness has been occasioned by the same amount of fruits, vegetables, fish, and meats not canned. A moment's reflection will show that food exposed to a high degree of heat, as all canned goods are, in the preserving process, more likely to be free from disease-producing germs, and as canned goods are usually put up at the sources of supply while fresh, and are hermetically sealed while in that condition, they are really fresher and more wholesome than the

so-called "fresh" fruits, etc., which are exposed for considerable periods of time in city markets. Drs. Wilbur, Quinby, Davison, D. Benjamin, and H. Wharton Amerling discussed the paper.

Dr. Benjamin read a paper on "The Relation between Drinking Water and Typhoid-Fever." In the face of what is known on the subject, he said he did not think that any student of sanitary science could deny that the poison of typhoid may be carried by the water-supply. If the people could be made to understand that almost all the cases of typhoid-fever come from the water-supply, and that there is no disease more easily prevented than this, there would be accomplished the first great step toward the annihilation of one of the worst destroyers of mankind.

Drs. Baldwin, Hunt, Quimby, and Raymond, of Brooklyn, discussed the paper. The latter believed that the fever was not conveyed by water alone. The disinfection of public sewers would doubtless decrease the disease in cities.

Professor Raymond, late Commissioner of Health of Brooklyn, delivered an address on "The Chief Points in Sanitary Administration; What should be Required as to Vital Returns and the Notification of Disease." The question considered first was that of the organization of boards of health. According to his opinion, the organization that is best is that of a single head. The head of the department should be assisted by a deputy, to represent him when ill or necessarily absent for some other cause. This deputy should be clothed with powers equal to those of his superior. There should be also some one on the staff whose duty it is to take charge of vital statistics. A typical health board should be one composed of men who devote their entire time to its business. Persons who have their living to make will of necessity always subordinate public to private duty. With regard to the duties of the medical inspectors, each one should be assigned a district and kept in it permanently. All the subordinates in a health department should be, in a sense, experts. The medical inspectors should have their duties confined to medical matters. Every board of health should also have a chemist, to determine questions of adulteration of food, and a certain number of permanent vaccinators. A veterinarian is also a necessary adjunct

to a properly equipped health department. It is absolutely essential for the protection of the community that meat be inspected regularly, the viscera as well as the carcasses of animals.

He described the methods to be pursued by each attaché of the health department, advocating thorough and prompt work in each branch. The physicians' returns should be made the basis of the work of the department.

Dr. D. L. Wallace, of Newark, made remarks on the paper, adding several interesting suggestions.

The Executive Council reported the following nominations, all of whom were elected for the ensuing year :

President, W. K. Newton, M.D., of Paterson ; First Vice-President, E. L. B. Godfrey, M.D., of Camden ; Second Vice-President, H. Mitchell, M.D., of Asbury Park ; Recording Secretary, D. C. English, M.D., New Brunswick ; Corresponding Secretary, Professor J. Madison Watson, Elizabeth ; Treasurer, J. C. Pumpelly, Morristown ; Executive Council (with the above-named officers), Dowling Benjamin, M.D., Camden, chairman ; Merrill E. Gates, L.D., New Brunswick ; Hon. E. O. Chapman, Trenton ; Rev. Dr. A. E. Ballard, Ocean Grove ; G. P. Olcott, C.E., Orange ; Professor Charles Jacobus, New Brunswick ; C. B. Brush, C.E., Hoboken ; Professor Wright Eckersly, Long Branch ; Rev. F. R. Brace, Blackwoodtown ; C. P. Bassett, C.E., Newark ; Hon. J. A. McGrath, Jersey City ; Shippen Wallace, Ph.D., Burlington ; S. H. Hunt, M.D., Long Branch ; Uriah White, Asbury Park ; D. L. Wallace, M.D., Newark.

NEW YORK.—The total reported mortality of 120 cities and towns, with populations from 2225 to 1,439,000, by State Board *Bulletin* for November, was 6872, of which 35.2 per cent were under the age of five years. From zymotic diseases there were 1466 deaths, a ratio of 213.33 per 1000 mortality. From diarrhœal diseases the ratio per 1000 was 24.15 ; from typhoid-fever, 22.85 ; from croup and diphtheria, 98.22. From consumption the ratio of mortality was 142.90 per 1000, and 220.66 per 1000 deaths above the age of five years. The combined death ratio per 1000 from zymotic diseases, consumption, and puerperal diseases was 366.41. From acute respiratory diseases there were 153.66 deaths per 1000 total

mortality. For the preceding month 250 delayed returns have been received—the total mortality for October to this time (November 1st) is 7620. A case of small-pox occurred in Yonkers in November; measles prevails largely in the same place.

New York City, 1,439,000: Deaths for the month, 3076; under five years, 1290; of zymotic diseases per 1000 deaths from all causes, 232.40. By croup and *diphtheria*, 314; *typhoid-fever*, 43; *measles*, 166; *malarial* diseases, 35; whooping-cough, 13; diarrhœal diseases, 87; *consumption*, 459; acute respiratory diseases, 540. Death rate, 25.94.

Since the date of the November State Board *measles* and *diphtheria* have greatly increased in New York, insomuch in some quarters as to have caused a good deal of alarm. In the four last weekly reports in December there were of diphtheria 471 cases, with 207 deaths; and of measles, 1979 cases, with 232 deaths. *Small-pox*, also, has been reported, during the first weeks in December.

Brooklyn, 690,000: Deaths, 1248; under five years, 465; of zymotic diseases per 1000 deaths from all causes, 222.75. By croup and *diphtheria*, 139; *typhoid-fever*, 33; *malarial* diseases, 39; *whooping-cough*, 12; *scarlet-fever*, 15; *measles*, 17; *small-pox*, 2; *diarrhœal diseases*, 21; *consumption*, 165; acute pulmonary diseases, 219. Death rate, 22.00.

Small-pox in Brooklyn, as condensed in the preceding paragraph, from the State Board *Bulletin*, is incomplete, probably due to the circumstance that most of the deaths from this disease take place in the small-pox hospital, in the town of Flatbush. Of cases during the month of November, there were 22, with 4 deaths. Not one of those who died had ever been vaccinated. During the month of December there were 22 cases, 14 deaths; and of these deaths, only 1 had ever been vaccinated, and that one was in the case of a pregnant woman, in whom the attack of varioloid appeared to have brought on premature child-birth, which rendered it fatal. The extraordinary fatality in the 22 cases during the month of December was in consequence of the diseases breaking out in a nest of practical anti-vaccinationists. There has been a similar occurrence since, the full details of which are not yet complete.

Buffalo, 202,818: Deaths (for four weeks ending November

27th), 292 ; under five years, 127 ; of zymotic diseases per 1000 deaths from all causes, 219. By *croup* and *diphtheria*, 37 ; *typhoid-fever*, 3 ; *malarial* diseases, 4 ; *diarrhœal* diseases, 8 ; *consumption*, 30 ; *acute respiratory diseases*, 34. Death rate, 18.77.

Rochester, 101,000 : Deaths, 133 ; under five years, 46 ; of zymotic diseases per 1000 deaths from all causes, 284.70. By *croup* and *diphtheria*, 21 ; diarrhœal diseases, 7 ; *typhoid-fever*, 3 ; *consumption*, 17 ; *acute respiratory diseases*, 9. Death rate, 15.8. The *lowest* death rates of any cities in the State of 10,000 population and upward were those of Ithaca and Lockport, each 9.60. The *highest* death rate of any of 10,000 population and upward was that of New York, 25.94. The *lowest death rate* of any city or town, regardless of population, was that of Fort Edward (4800), 2.5. The *highest death rate* was that of New Rochelle (5276), 33.90.

Ohio.—According to the *weekly bulletins*, from 64 to 77 observers, for the four weeks ending November 27th, the principal diseases named in the order of their greater prevalence and the number of cases reported were : *measles*, 815 ; *diphtheria* (including "croup"), 637 ; *scarlet-fever*, 353 ; *typhoid-fever*, 286 ; *whooping-cough*, 117 ; *small-pox*, 3.

Cincinnati reports 615 deaths in a population of 325,000, of which 292 were under five years of age. The annual rate per 1000 is shown to be 22.7. There were 226 deaths from zymotic diseases and 61 from consumption.

The Ohio State Sanitary Association will hold its fourth annual meeting in the Board of Trade Room, City Hall, Columbus, O., on Thursday and Friday, February 10th and 11th, 1887, at which time the following papers will be presented and discussed :

"The Probable Results of Sanitation One Hundred Years Hence." D. J. Snyder, M.D., Scio, O.

"A Scientific Standard for the Safety of Illuminating Oils." D. H. Beckwith, M.D., Member of the State Board of Health, Cleveland, O.

"The Cause of Deafness and Blindness, with Special Reference to the Eruptive Fevers." S. L. McCurdy, M.D., Surgeon for the Penna County, Dennison, O.

"Cremation of the Lower Animals." E. S. Rickets, M.D., Portsmouth, O.

"Water-Closets and Privy Vaults." John McCurdy, M.D., Youngstown, O.

"Injurious Gases." David O'Brine, M.E., M.Sc., M.D., Assistant Professor of Chemistry, Ohio State University, Columbus, O.

"Our Fever Epidemic from Drinking Sewerage." C. E. Kurz, M.D., Bellaire, O.

"The Sanitary Condition of Sandusky Before and After the Completion of Water Works and a Sewerage System." Elwood Stanley, M.D., U. S. Marine Hospital Service, Sandusky, O.

"The Plumber's Rôle in the Sanitary Drama of the Day." E. A. Futerer, Esq., Master Plumber, Columbus, O.

"Syphilis from a Sanitary Standpoint." C. E. Beardsley, M.D., Ottawa, O.

President's Annual Address. H. J. Herrick, A.M., M.D., Professor of State Medicine and Hygiene, Western Reserve University, Cleveland, O.

"School Sanitation." Hon. LeRoy D. Brown, Ph.D., ex-State School Commissioner, Hamilton, O.

"Some of the Practical Results of our Criminal Laws from a Sanitary Standpoint." R. Harvey Reed, M.D., Mansfield, O.

Annual election of officers.

Selection of the next place of meeting.

"Diagnostic Responsibility." H. M. Lash, M.D., Athens, O.

"The Results of a Mistaken Diagnosis and its Consequences in Loss of Life and Financial Paralysis." Thomas W. Gordon, M.D., Georgetown, O.

"Examination of Air of Apartments." Curtis C. Howard, M.C., Professor of Chemistry, Starling Medical College, Columbus, O.

"Hygiene of the Sick Room." F. C. Larimore, M.D., Mt. Vernon, O.

"The Sanitary Condition of the City of Mexico, from Personal Investigation." E. D. Shreve, C.E., Bucyrus, O.

"The Plumber's Plea for Representation on the State Board of Health." William Halley, Master Plumber, Columbus, O.

"Ptomaines and Poisoning by Tainted Foods." J. U.

Barnhill, B.S., M.D., Lecturer on Toxicology, Columbus Medical College, Columbus, O.

"The Relation of Climatic Changes to Certain Diseases, with Chart Illustrations." E. M. Mark, Esq., Secretary Ohio Meteorological Bureau, Columbus, O.

"The Chronic Insane under County Care, and in the Care of Families." F. H. Darby, M.D., Chairman of Sanitary Committee, Morrow, O.

Reduced rates have been secured on all railroad lines centring in Columbus, and will be granted to all persons desiring to attend the meeting, who, on application to the secretary at least one week prior to the time of the meeting, will be furnished with the proper certificates, which *must* be secured before leaving home.

R. Harvey Reed, M.D.,
Secretary, Mansfield, O.

Pennsylvania.—The State Board of Health has issued a cogent circular on the prevalence of *typhoid-fever*. While not yet able to show the loss of life in the commonwealth from this cause, the secretary of the Board deduces the conclusion from approximate estimates that there are from *thirty* to *forty* thousand cases of typhoid-fever, and not less than *three thousand deaths* from it annually. The Plymouth epidemic is cited as a striking example of the most common cause—drinking water befouled by the seepage of cesspools and privy vaults. Circulars on the causes and prevention of diphtheria and other infectious diseases have also been broadcast, with the same general purpose—educating the people.

Philadelphia reports for four weeks ending November 27th 1514 deaths in a population of 971,363, of which 531 were under five years of age. The annual death rate was 20.12. There were 228 deaths from zymotic diseases and 223 from consumption.

The health officer's annual report of births, marriages, and deaths for the city of Philadelphia for 1885, but recently issued, reports: Population, 949,432; marriages, 7676—decrease on previous year, 961: 8.6 per 1000 of population. Births, 22,656—increase over previous year, 496: 23.86 per 1000 of population. Still-births, 992. Deaths, 21,392—in-

crease over previous year, 1393 ; 7606 were of children under five years. Death rate for the year, 22.53. The prevailing causes of death were : *Typhoid-fever*, from which there were 610—52 less than for previous year ; the smallest number from this cause in any month was 3, in June ; the largest, 28, in August. For a period of twenty-four years there have been but seven years when the number of deaths from typhoid-fever was larger. *Diphtheria*, 600—a decrease of 80 on previous year. *Scarlet-fever*, 375—a decrease of 165 on previous year. Of *small-pox* there were 14 cases, with 3 deaths. From *consumption* there were 2821 deaths—13.18 per cent of the deaths from all causes.

Pittsburg reports 337 deaths during November in a population of 200,000, of which 165 were under five years of age. There were 101 deaths from zymotic diseases and 27 from consumption. The annual death rate was 21.25.

RHODE ISLAND.—*Providence* reports for November 156 deaths in a population of 120,000, of which 53 were under five years of age. The annual rate per 1000 is shown to be 15.60. There were 32 deaths from zymotic diseases and 20 from consumption.

Newport.—We extract from the *Newport News* of January 4th the following pertinent remarks of Mayor Powel, in his inaugural to the City Council in regard to sewerage : "It is a point on which the most strenuous efforts should be made by every citizen, for it is one that affects all alike, at once ; for the state of the drainage, or rather the want of it, in the old part of the city, as well as in some of the large houses on the avenue, can hardly be believed, unless seen. I accompanied the inspector of nuisances on a tour of inspection last spring, and I must say, frankly, that I saw many houses and places in a condition (with no way of bettering many of them, permanently or properly) that I could not have believed it possible if I had not seen them myself, and a reckless, callous disregard for human health and life displayed, that was hard to believe could be justified in any way, or by any one—no drains, no sewerage, tubs overflowing with filth for cesspools, houses without cellars, the filth running under them, no regard to any sanitary conditions whatever. It may be all very well and economical to wink at such a state of

affairs, so long as nothing happens; but how would it be if this city was visited by any epidemic? This town should be provided with a complete system of drainage, or as much of the system as can be brought about *at once*, and no more time spent in talking about it, or any hindrance put in its way. The system which has been adopted was designed by most competent engineering skill, was approved, in any minor alterations that have been made on the score of economy, by equally recognized engineering skill of your own selection, and there is no cause for delay, and it is the bounden duty of every man in the city, rich or poor—for it is a common cause—who has the interest and welfare of Newport at heart, to see that means are furnished to carry it out without delay. I believe it would be money well invested for the city to issue bonds to put the whole system in at once, or at the very least the main trunk sewers, and be done with it, and let those who come after us, and who will be far more benefited than those of the present day by the increased prosperity, popularity, and population, help pay the expense. This city has a debt of only about $131,000 all told to-day, and if by creating a debt of not immoderate proportion to its size for so all-important an object, it can remove the dangers threatened by the present want of sewerage, and, equally important, remove the chance of any possible check to her prosperity as a watering-place, by even a groundless scare, or feeling of insecurity, it should be done."

TENNESSEE.—November closed with an increase of *typhoid-fever* and those diseases which affect the upper air passages and lungs. The contagious and infectious diseases reported in October have, without exception, during November invaded new territory, as *diphtheria* is reported in four counties in which it had not recently existed, *whooping-cough* in six, *measles* in five, *scarlet-fever* in three, and *mumps* in six.

The principal diseases named in the order of their greater prevalence in the State for November, were, *malarial-fever, pneumonia, typhoid-fever, bronchitis, typho-malarial-fever, catarrhal-fever, tonsilitis, and rheumatism.*

Whooping-cough is reported in the counties of Blount, Coffee, Davidson, Dyer, Gibson, Hancock, Jefferson, Lewis, Madison, Rutherford, Smith, Stewart, and Wilson. *Diphtheria* in

Bradley, Cannon, Davidson, Jackson, Knox, McMinn, Sevier, Shelby, Smith, Stewart, Washington, and Williamson.

Measles in Bradley, Cumberland, Davidson, Hamilton, Macon, Maury, Montgomery, Stewart, Smith, Williamson, and Wilson. *Mumps* in Bradley, Cocke, Hancock, Lewis, Rhea, and Sevier. *Scarlet-fever* in Bradley, Davidson, Knox, and Madison. *Membranous croup* in Carroll County, *meningitis* in the counties of Jackson and Lawrence, *erysipelas* in Henry and Obion, *coryza* in Henry, Putnam, and Sevier, *chicken-pox* in Gibson County.

Death Rates.	Chattanooga,	white,	23.29 ;	colored,	26.18 :	24.42
" "	Clarksville,	"	12.00 ;	"	32.00 :	19.50
" "	Knoxville,	"	13.86 ;	"	24.93 :	16.34
" "	Memphis,	"	14.32 ;	"	30.36 :	20.02
" "	Nashville,	"	13.41 ;	"	26.64 :	18.10

The meteorological features of the month were mean temperature, 46°.2 ; highest, 80° ; lowest, 12°. Mean depth of rainfall, 6.39 inches above the average mean for the month for the last four years.

Frosts were reported at different stations in the State on all days except the 10th, 11th, 17th, and 30th, and those reported heavy or killing were on the 1st, 2d, 5th, 9th, 13th, 14th, 16th, 26th to 29th.

VIRGINIA.—*Richmond*—population, white, 56,000 ; colored, 44,000 ; total, 100,000—reports for November 67 deaths of whites and 87 of colored, showing the respective death rates to be 14.36 and 23.73. The deaths of children under five years of age numbered 59. There were 37 deaths from zymotic disease and 16 from consumption.

WISCONSIN. — *Milwaukee* — population, 167,000 — reports during November 240 deaths from all causes, of which 62 were due to zymotic diseases and 32 to consumption. There were 66 deaths of children under five years of age. The annual death rate is shown to be 17.25.

VITAL STATISTICS OF IMMIGRATION AT THE PORT OF NEW YORK FOR DECEMBER, 1886.—(1) Neustria, Marseilles, 655 passengers, 2 deaths ; (3) Westernland, Antwerp, 644 passengers, 2 deaths, 1 birth ; (5) Fulda, Bremen, 894 passengers,

2 births ; (6) Egypt, Liverpool, 343 passengers, 1 death ; (6) Rhætia, Hamburgh, 677 passengers, 1 death, 3 births ; (12) Amalfi, Hamburgh, 155 passengers, 1 death ; (20) Werra, Bremen, 463 passengers, 2 births ; (20) Britannic, Liverpool, 402 passengers, 1 death ; (21) Château Leoville, Bordeaux, 52 passengers, 1 birth ; (25) Wieland, Hamburgh, 268 passengers, 1 death.

Total passengers, 4553 ; deaths, 9 ; births, 9.

Correction : The summary in December number was for November instead of "October."

MORTALITY STATISTICS ABROAD in cities containing 100,000 inhabitants and upward at the most recent dates. During the *week* ending *December 18th*, of 14 large English cities, the average annual death rate was 22.7. The lowest was in Sheffield and Birmingham, each 17.1, the highest in Dublin, 29.6. In London the rate was 18.8 ; Paris, 24.5 ; Havre, 30.6 ; Lyons, 21.3 ; Saint-Étienne, 30.1 ; Cologne, 26.1 ; Brussels, 22.0 ; Anvers, 15.5 ; Gand, 20.3 ; Liège, 18.4 ; Breslau, 27.4 ; Christiania, 19.5. During the *week* ending *December 11th :* Amsterdam, 25.8 ; Rotterdam, 23.1 ; Hague, 27.7 ; Berlin, 24.6 ; Hamburg, 34.8 ; Munich, 34.5 ; Dresden, 26.2 ; Leipzig, 20.8 ; Frankfort, 18.2 ; Koenigsberg, 27.9 ; Magdeburg, 22.8 ; Hanover, 17.9 ; Stuttgart, 16.4 ; Bremen, 16.3 ; Düsseldorf, 21.2 ; Nuremberg, 26.3 ; Dantzig, 27.6 ; Strasburg, 22.8 ; Chemnitz, 30.0 ; Elberfeld, 22.0 ; Altona, 31.3 ; Barmen, 21.2 ; Vienna, 25.5 ; Pesth, 36.8 ; Prague, 25.1 ; Cracow, 20.1 ; Copenhagen, 21.4 ; Stockholm, 22.2 ; Warsaw, 27.6 ; Odessa, 38.3 ; Venice, 27.9 ; Bucharest, 24.4. During *week* ending *December 4th :* St. Petersburg, 23.9 ; Nice, 16.4. During the *month of November :* Marseilles, 25.5 ; Bordeaux, 24.4. *November 3d–9th :* Cairo, 43.6 ; Alexandria, 35.8 ; Port Said (10,693 inhabitants), 34.0 ; Suez (9985), 10.4. *November 17th–23d :* Bombay, 19.8. *October 31st* to *November 6th :* Calcutta, 32.6 ; Madras, 38.1.

Cholera.—From *Bologne* we have no later reports than for the month of September, as given in December number, 67 deaths. In *Pesth*, deaths reported, November 14th to 20th, 4 ; 21st to 27th, 2. None since. *Calcutta*, from October 3d to 30th, 268 deaths. In *Japan*, during the first half of the

year, just concluded, 10,276 cases, with 7803 deaths, were reported. At the most recent dates it continued to prevail extensively in *Yokohama*, *Tokio*, and *Corea*. The mortality in Corea has been unprecedented. At *Siool*, the capital, the number of deaths has been over 1000 daily, and the means of burial wholly inadequate. In South America telegrams from *Mendoza via* Santiago, December 23d, state that there were 86 deaths from cholera there the day before, and 118 new cases. Telegrams from Buenos Ayres *via* Valparaiso and Galveston, dated January 3d, announced that during the preceding twenty-four hours 56 new cases of cholera and 20 deaths had occurred. During last month there were 700 cases and 352 deaths in Buenos Ayres. In Mendoza during the last twenty-four hours there were 43 cases and 23 deaths.—Consul Bridges telegraphs the State Department, December 19, that the cholera epidemic has assumed so startling a phase in Montevideo that the authorities were compelled to make an official announcement of the fact.

Small-pox.—Deaths reported from this disease, at most recent dates, received as follows: During the *week ending December 18th:* In London, 1; Paris, 3; Alost (Belg.), 2. *Week ending December 11th:* Vienna, 4; Warsaw, 6; Odessa, 1; Venice, 2; Pesth, 62; Prague, 1. *November 26th* to *December 2d:* Cairo, 2; Port Said, 5. During *month of November:* Marseilles, 23. *November 16th–30th:* Nice, 2. *October 31st* to *November 6th:* Rome, 14. *Month of October:* Milan, 29; Saragossa, 21. *Month of September:* Bologne, 26; Algiers, 1. *Month of August* (as before reported), 41.

Measles, considerably increased in English cities, since December reports: 138 deaths during the week ending December 18th, of which 57 were in London. Of *scarlet-fever* there was less. *Diphtheria* and *croup* were particularly prevalent, at latest dates, in Paris, Marseilles, Berlin, Hamburg, Dresden, Grenada, and Copenhagen. *Typhoid-fever* deaths, *December 12th* to *18th:* Paris, 40; London, 13; Dublin, 9; Glasgow, 8; Manchester, 7; Liverpool and Belfast, each 4. *December 5th* to *11th:* Hamburg, 15. During the *month of November:* Marseilles, 38; Bordeaux, 14.

OBITUARY.

HON. ERASTUS BROOKS, after a brief illness, died at his residence, West New Brighton, S. I., November 28th, 1886, in the seventy-second year of his age. Mr. Brooks had been for more than forty years a leading journalist; for one term member of Congress, for several terms member of the Legislature of New York, and for many years a well-known public-spirited citizen of unimpeachable character. On the organization of the State Board of Health of New York, in 1880, he was appointed a member, and thereafter took an active interest in all of its work for the promotion of the public health. He was especially earnest and influential in securing legislative enactments for the prevention of food adulteration and bad plumbing, and exerted himself for such amendments of the tenement-house laws as he thought would be efficient in the prevention of overcrowding and smothering, which unfortunately still obtain. By his death the community in which he lived has lost one of its most endeared members, and the State an honest, able, public-spirited, and most useful citizen.

LITERARY NOTICES.

DISEASES OF THE LUNGS AND PLEURÆ, INCLUDING CONSUMPTION. By R. DOUGLAS POWELL, M.D., London, Fellow of the Royal College of Physicians; Physician to the Middlesex Hospital and to the Hospital for Consumption and Diseases of the Chest, at Brompton; late Assistant Physician and Lecturer on Materia Medica at the Charing Cross Hospital. Third edition, rewritten and enlarged, with illustrations, including two lithographic plates; being Vol. XI. of Wood's Library for 1886; and

DISEASES OF THE BLOOD AND NUTRITION, AND INFECTIOUS DISEASES; being Vol. IV. of "A HANDBOOK OF PRACTICAL MEDICINE," by DR. HERMANN EICHHORST, and Vol. XII. of Wood's Library for 1886 (completing the set, price of set, $15). Illustrated. New York: William Wood & Company.

The first-named of these concluding volumes of Wood's Library for 1886 is fully up to time with regard to the relation of *bacilli* to tuberculosis of the lungs, which is delineated and described with clearness. The anatomy and functions of the lungs, physical examination of the chest, diseases of the pleuræ and pneumonia, are also graphically described by means of good wood-cuts and concise text, by which the work is altogether rendered alike useful to the medical student and busy practitioner.

The December volume, by Eichhorst, is, like the preceding volumes in the series for the year, by the same author, thoroughly practical and comprehensive. But in the section on the etiology of yellow-fever there is some ambiguity: "It often appears on shipboard; or vessels coming from yellow-fever localities, despite the fact that the disease does not appear upon the vessels themselves, infect other ports when they discharge their cargo, bilge water, or other refuse." Cases where the disease does not appear upon the vessels themselves are exceptional. The fact is, the disease infects the vessels themselves, and frequently for long periods of time through various vicissitudes of climate, despite the discharge of cargo, bilge water, or other refuse; and it is by no means of unfrequent occurrence that cargoes of certain kinds, as well as persons, contract and convey the poison from the vessel. This apparent deficiency in the work, however, may be properly ascribed to the want of space. The subject of infectious diseases is altogether too large for adequate treatment in three hundred pages of an octavo volume. In the section devoted to cholera, the virus of the "so-called comma bacilli" of Koch is accepted as extremely probable, and it is well illustrated; while very little is said of the investigations of other observers in controversion of Koch's discovery. Pettenkofer's theory is not mentioned. The typhoid bacillus is depicted, and the section devoted to this disease is especially cogent and instructive.

Papers Read before the Medico-Legal Society of New York from its Organization. Third Series, 1875 to 1878. Revised edition. 8vo, pp. 560. Medico-Legal Society, New York. Price, in cloth, $3.50; paper, $2.50. The frontis-

piece of the volume is embellished with an excellent portrait of Clark Bell, Esq., who has been the moving spirit of the Medico-Legal Society from the time he first became a member of it, in 1870. In a brief sketch of his life by his friend, R. B. K. (Richard B. Kimball, Esq.), which follows the portrait, it is truthfully stated that Mr. Bell has done more for the promotion of medical jurisprudence in this country than any other person. This he has done chiefly in virtue of his connection with this society, which he has served six years as president, not only by numerous and important contributions to it, but by an extensive correspondence with distinguished co-workers in the same field at home and abroad. Other portraits and biographical sketches in this volume are of Dr. John Connoly, Hon. Charles P. Daly, Dr. R. Swayne Taylor, William G. Davies, Esq., Dr. George M. Beard, Dr. T. Romeyn Beck, Hon. E. W. Stoughton, and William A. Beach. These alone make a most acceptable and valuable volume to all who rightly appreciate and who would treasure up mementos of the foremost leaders in this branch of science. But we have here besides many contributions of great value, a part of which only need be named to indicate what a treasury of knowledge this work is: "Malpractice in Surgery, and Loss of Consciousness," by Frank H. Hamilton, M.D.; "Proper Status of the Insane and Feeble-Minded," by John Ordronoux, Esq., M.D., LL.D.; "Milk in its Medico-Legal Aspects," by Professor R. O. Doremus, M.D.; "School-Room Poisoning in, and Sanitary Interest of the Public Schools of New York," "Reports of a Committee;" "Railway Injuries of the Spine," by Professor William A. Hammond, M.D., and as many more, all on subjects of important interests to the well-being of the most advanced stages of society, and without which no medical or law library is complete.

SCRIBNER'S MAGAZINE, the first number of which, for January, was issued December 15th, appears to have secured public favor at a single bound, the first edition of 100,000 having been exhausted, and a second of 40,000 required to meet the demand. For February number a notable illustrated article is announced, "The Likeness of Cæsar," by Mr. J. C. Ropes.

THE SANITARIAN.

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NUMBER 207.

THE PROGRESS OF SANITATION, AS SHOWN BY ITS LIFE-SAVING RESULTS IN ENGLAND DURING THE REIGN OF QUEEN VICTORIA.

Abstract of an Address by Captain DOUGLASS GALTON, C.B., D.C.L., F.R.S., in Opening the Meetings of the One Hundred and Thirty-third Session of the Society of Arts, London, November 17, 1886.

A RETROSPECT.

IN opening the meetings of the One Hundred and Thirty-third Session, it appeared to me that, as we are entering upon the jubilee year of the Queen's reign, it might be interesting to take stock, as it were, of the progress which has been made by the nation in some one of the branches of usefulness to which the proceedings of this Society have contributed ; and it occurred to me that the most fitting subject to select would be that of the progress which has been made in sanitation during her Majesty's reign.

The Queen's accession occurred during an epoch of important social changes.

A fall in prices and in wages had followed the termination of the great war. The substitution of machinery for hand labor had occasioned considerable alterations in the condition of the laborer ; for while this substitution proved of immense benefit to the nation, it told heavily on those who were brought up in the old ways. It removed manufactures to new localities ; it threw large numbers of workmen out of employment ; and the conditions of labor had scarcely become adjusted to the new order of things, when the Queen ascended the throne.

Fevers were rife among the poor, food was dear, the poverty of the very poor was intense ; one person out of every eleven was a pauper, and one person out of every 500 was committed for trial.

REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES.

The first decennial census of the population of England and Wales had been taken in 1801, in which year the population of England was 8,892,536. At the Queen's accession it had risen to 15,268,056, but it was only then that civil registration of births, marriages, and deaths, including the registration of the diseases which were the causes of death, first came into operation.

The Queen's accession to the throne took place on the 20th of June, 1837, and the registration came into operation on the following 1st of July, and thus the jubilee year of the Queen's reign is the jubilee year of registration of disease.

To the sanitarian the principal value of registration has been that it furnished a basis of accurately observed facts which has enabled the medical man to substitute numerical expressions for vague conjecture, and by affording the necessary data for ascertaining the prevalence and intensity of epidemics, has led to an examination of the existing causes of the diseases.

This knowledge was the first step toward their prevention.

Thus registration of the causes of death forms the basis upon which all scientific sanitary investigation necessarily rests ; therefore the year of the Queen's accession forms the commencement of intelligent sanitary progress in this country.

Dr. Farr, in submitting the abstracts of the recorded deaths for the first half year of registration, between the 30th of June and the 31st of December, 1837, draws attention to this, and, after showing that a considerable proportion of sickness and death may be expected to be suppressed by social progress, and the general adoption of hygienic measures which were then in actual but partial operation, goes on to say :

"It may be affirmed, without great risk of exaggeration, that it is possible to reduce the annual deaths in England and Wales by 30,000, and to increase the vigor (may I not add the industry and wealth ?) of the population in an equal proportion ; for diseases are the iron index of misery, which recedes before strength, health, and happiness, as the mortality declines."

Thus, although the science of vital statistics, upon which all scientific sanitation is based, was then in its infancy, Dr. Farr foretold the important results which would flow from a registration of the causes of death.

DEFECTIVE SANITARY CONDITION OF THE PEOPLE AT THE BEGINNING OF THE QUEEN'S REIGN.

The year 1838 was the first complete year of registration.

The first report of the Registrar-General brought forward the sanitary condition of different parts of the country, and of different classes of the population. Disease was as prevalent among the laboring population in rural villages as it was in the most crowded and filthy districts in towns, and, on the motion of the Bishop of London, the House of Lords, in August, 1839, presented an address to the Queen, begging her to direct an inquiry into this prevalence of disease. From this period may be said to date that great social and sanitary movement which has tended so largely to ameliorate the moral as well as the physical condition of the people of this island, and which forms one of the most prominent features of the Queen's reign.

The Poor-law commissioners were directed to report upon the condition of the laboring classes ; and the direct evidence of much preventible disease, which the records of disease and death furnished from all parts of the country, formed the basis on which the commission founded their recommendations.

In towns the people were crowded in courts and alleys ; they swarmed in cellars which were neither ventilated nor drained.

In 1837 it was calculated that one tenth of the population of Manchester and one seventh of the population of Liverpool lived in cellars. The following is a description of a court in Manchester, with its accompaniment of cellar accommodation :

" It was unpaved ; down the middle a gutter found its way, every now and then forming pools in the holes with which the street abounded. Women from their doors tossed household slops of every description into the gutter, which ran into the nearest pool, which overflowed and stagnated.

" Steps from this filthy court led down to a small area, where a person standing would have his head one foot below

the level of the street, and might, without the least motion of his body, at the same time touch the windows of the cellar and the damp, foul wall right opposite. You went down one step from this foul area into the cellar, in which a family of human beings lived.

"It was very dark inside. The window-panes, many of them, were broken and stopped with rags, which was reason enough for the dusky light which prevailed at mid-day.

"The smell was so fetid as to almost knock down the incomer.

"The children lay on the damp, nay, wet, brick floor, through which the stagnant moisture of the street oozed up."

The dead were buried in overcrowded churches, chapels, and churchyards in the middle of towns. In 1845 a chapel in the immediate neighborhood of Lincoln's-inn-fields was used as a school-room in the day-time, and a dancing saloon at night; in the cellars underneath this chapel 10,000 bodies had been interred in the seventeen years ending 1840, the burials were still continuing, and the old coffins were removed through a contiguous sewer to make room for new ones.

The rural districts were no better. The condition of rural cottages may be gathered from a graphic account by Sir H. Acland. The village school was a room 11 feet by 7 feet, where 13 children were being taught lace-making. They slept in a room 11 feet by 12 feet, the beds touching, so that there was no space to stand between them. Next door, a cottage, occupied by three men, had as its only furniture a log of wood to sit on; the bedroom was reached by a short ladder with six rungs, of which two were gone; the only bedding was some straw, slept on till it was as small as chaff; the only bedclothes some sacking.

An agent who managed several large estates in the Midland counties remarked of the cottages of those days:

"I ever think of the squalid misery of poor, wretched, woebegone men and women, and, above all, of children, from whom happiness of any wholesome kind seemed hopelessly gone; the hungry, half-starved families crowding round a miserable bowl of potatoes, often without even a bit of bacon, and thankful indeed to get it, supplemented with a supply of bread and weak tea."

In the towns this condition of things arose from the great increase of population which had been taking place for some

years previously, coincident with the rapid expansion of our trade and manufactures, coupled with the absence of legislative provisions to meet the new exigencies which had arisen, and with which the older laws, in consequence of that increase, were unable to cope.

But there were other active causes. For instance, the commissioners state that parochial administration operated mischievously in degrading the habitations of the laboring classes, and in checking tendencies to improvement. Owners of cottage tenements, when acting as administrators of the Poor-law, got their own tenants excused from the payment of rates, and obtained higher rents from the occupiers in proportion to the exemption.

The operation was as follows : The legal ground for exemption was not the value of the tenement, but the destitution or inability of the tenant to pay ; but inasmuch as the occupation of a well-conditioned tenement, or a tenement in advance of the others, would be popularly considered *primâ facie* evidence of ability to pay rates, the cottage speculator would not incur the expenses of improvement or repair, because it would be evidence against the exemption by which he would gain. The exempted tenements were of a very inferior order. The rents collected for them were exorbitant, and such as ought to have insured tenements of a higher quality.

In some cases cottage tenements were owned by the parish, where the inmates were not only excused from the payment of rates, but from the payment of rents. To the parish the property yielded nothing ; the pauper lived on in filth and wretchedness, in a hovel of which he did not dare to complain, because he held it by sufferance.

Under the then new Poor-law the commissioners had power to authorize their sale, and in the cases where the parish property was sold, a vast improvement in the external appearance of the cottages took place, and the depressing effect of the exemption was well illustrated by the effect of the withdrawal.

The depression of the tenement depressed the habits and condition of the inhabitants. Thus, if a woman who had been brought up cleanly and thrifty and well-conditioned married and went to live in these wretched dwellings, she became slatternly and drunken. The worst of it was, that the laborer

evidently had the means of paying for a more decent dwelling, because the exemptions from rates were charged to him as so much extra rent. But he could not obtain improvements in his house, water-supply, or drainage, or in the paving of the surface round his house, or the removal of refuse, by his own unaided efforts ; and there existed then no means by which either his landlord or the community could be compelled to perform these services.

In speaking of the unsanitary condition of houses, we must not forget the effect of the window tax. This tax had been established for one hundred and fifty years. Air and sunshine are the first requirements of healthy dwellings, and the window tax induced every builder to shut out the sun and exclude the air, so that poor men were unable to afford the luxury of adequate windows for their dwelling-rooms, or of any windows for their closets. Darkness and dirt go hand-in-hand, and in the class of houses above the cottages darkness and want of ventilation were much fostered by the window tax. This tax was not abolished till 1851.

INSUFFICIENCY OF SANITARY ADMINISTRATION AT THE BEGINNING OF THE QUEEN'S REIGN.

The laws then in force for the protection of public health were mainly based upon the common law that no man should do anything by which the health or personal safety or the convenience of the subject might be endangered or affected injuriously.

A common nuisance is defined to be an offence against the public, "either by doing a thing which tends to the annoyance of all the King's subjects, or by neglecting to do a thing which the common good requires." And under this definition, overcrowding was held to be a nuisance ; for it was held to be a common nuisance, and indictable, to divide a messuage in a town for poor people to inhabit, by which it would be more dangerous in time of infection.

At the commencement of the Queen's reign drainage over the whole country was provided for by various commissions of sewers. Their duty was limited to causing "to be made, corrected, or repaired, amended, put down or reformed, as the case shall require, walls, ditches, banks, gutters, sewers, gates,

cullices, bridges, streams, and other defences by the coasts of the sea and marsh ground."

The highway acts provided for road cleansing and road structure ; and there was a law for cleansing of ditches, which forbade throwing offal and foul refuse into the ditches which might lead to the pollution of streams.

The provision of pure water, and the disposal of the water after it had been fouled, had scarcely been thought about. No doubt in London and in some large towns water was provided by public companies or by the corporation ; but in almost every country town the water-supply was defective. Even in Bath, where the corporation supplied a large part of the town, it was mentioned as an illustration of the habits of many of the working population in that city, that :

"A man had to fetch water from one of the public pumps in Bath, the distance from his house being about a quarter of a mile. 'It is as valuable,' he said, 'as strong beer. We can't use it for cooking, or anything of that sort, but only for drinking and tea.' 'Then where do you get water for cooking and washing?' 'Why, from the river. But it is muddy, and often stinks bad, because all the filth is carried there.' 'Do you then prefer to cook your victuals in water which is muddy and stinks to walking a quarter of a mile to fetch it from the pump?' 'We can't help ourselves, you know. We could not go all that way for it.'"

Sir Henry Acland describes the water-supply of a village in Oxfordshire, some thirty-five years ago, as a pit in the middle of a field a quarter of a mile from the village, the sides of which were trodden down by cattle that went to drink, and deposited the filth all round.

The report on the sanitary condition of the laboring classes states that it was difficult to conceive the great extent to which the laboring classes are subjected to privations, not only of water for the purpose of ablution, house-cleansing, and sewerage, but of wholesome water for drinking and culinary purposes. While, however, the water-supply was insufficient even in London, on the other hand the necessity for providing means for getting rid of the fouled water was generally ignored.

It is stated, in the report of 1842, that the courts inhabited by the poorer classes in towns are generally not flagged ; they

are paved with a sort of pebbles ; they are always wet and dirty. The people, having no convenience in their houses for getting rid of waste water, throw it down at the doors ; that scarcely one house for the working classes will be found in which there is such a thing as a sink for getting rid of the water. It mentions, in a typical case, that where in one locality a large sewer had recently been made, the landlords are not compelled and do not go to the expense of making any communication from the courts to the sewer ; the courts are as wet and dirty and in as bad a condition as they were before the sewer was constructed ; and it is added that this miserable accommodation in the wretched courts pays a better percentage than any other description of property ; it pays as much as twenty per cent in many instances.

With regard to fæcal matter, the general practice had been for each house to have its cesspit, which was emptied at intervals by night men ; but in the poor districts the soil was allowed by the occupiers to accumulate for years to avoid the expense of emptying. Within the preceding twenty years water-closets had been introduced into the better class of houses. The refuse from these was generally allowed to flow into the cesspits ; but, to avoid the expense of frequent emptying, an overflow was made, where practicable, into sewers or adjacent ditches ; in other cases the refuse was turned directly into the sewers, and created a dangerous deposit.

The danger had begun to be noticed long before ; for in 1834 one medical witness stated to a Committee of the House of Commons that of all cases of severe typhus that he had seen, eight tenths were either in houses of which the drains from the sewers were untrapped, or which, being trapped, were situated opposite gully-holes ; and the report of the Poor-law commissioners remarks that this recent mode of cleansing adopted in wealthy and newly-built districts by the use of water-closets, which discharge all refuse *at once* from the house through the drain into the sewers, while it saves delay, prevents accumulation, and also saves the expense of hand labor, yet has the objection that if much extended it may pollute the water of the river into which the sewers are discharged. They, however, recommend that this danger should

be incurred, as a lesser evil, than the retention of the refuse in houses ; adding that :

"It is possible to remove the refuse in such a mode as to avoid the pollution of the river, and at the same time avoid the culpable waste of this most important manure."

The conditions under which the drains had been constructed were entirely different from those which became necessary with the increase of population. The sewers had been constructed for land drainage, and only with reference to the wants of the immediate locality, so as just to drain it to the nearest outlet, without any reference to any general plan of sewerage. The sewers were generally flat at the bottom, of stone or brick ; the joints were not specially water-tight, so that much of the liquid passed into the surrounding soil, and the floor of the sewers was covered with deposit, which had to be removed at much expense by hand, and in many cases the size and form of the sewers were adapted to enable the workmen to enter for cleansing purposes. When new lines of houses were built, new sewers were required for which outlets into the old sewers did not afford sufficient fall, and they then became choked with deposit. The cleansing of streets was not performed with uniformity or rapidity ; and the condition of many of the back streets and courts was deplorable. They were not properly paved, and had no conveniences.

The Poor-law commissioners recommended, in the report already mentioned, that the expensive and slow progress of the removal of the surface refuse of the streets by cartage might be dispensed with, and the whole at once carried away by the mode which is proved, in the case of the refuse of houses, to be the most rapid, cheap, and convenient—namely, by sweeping it at once into the sewers, and discharging it by water. This recommendation was largely adopted.

In order to convey some idea to your minds of the difficulties which would necessarily be caused by turning the street sweepings, which consisted largely of mud from macadamized roads, directly into the sewers, I may mention that at the present time in London every effort is made to stop the road material from passing into the sewers by sweeping the streets, and by placing catchpits at the gullies and cleansing them frequently, and that in the metropolis the quantity of dirt from

roads, and gullies, and of deposits from sewers, removed annually amounts to nearly 1,000,000 tons, and the annual quantity in those days cannot have fallen far short of 350,000 tons. The combined effect of turning the street sweepings and the water-closet refuse into sewers, with uneven falls and flat bottoms, naturally added to the deposit, and intensified the evils in such a manner as finally to force on improvements in the construction of the sewers.

REMEDIES PROPOSED IN THE REPORT OF THE POOR-LAW COMMISSIONERS OF 1839–42.

The general conclusions at which the Poor-law commissioners arrived in their report on the condition of the working classes were that disease originating in or propagated by means of decomposing refuse and other filth, and damp, close, and overcrowded dwellings, prevailed generally among the working classes in all parts of the kingdom ; and that while these diseases could be abated by improved sanitary conditions, they were not removed by high wages and abundant food, if sanitary conditions were absent. They also pointed out that owing to the defective water-supply cleanly habits were impossible.

In illustration of the loss caused to the nation by these preventible diseases, they mentioned that out of 43,000 widows and 112,000 destitute orphans relieved from the poor-rates, the greater number had lost their husbands or fathers from preventible diseases ; and that the youthful population of either sex brought up in crowded unwholesome dwellings, and under the adverse circumstances described, were deficient in physical strength and moral conduct, and grew up improvident, reckless, and intemperate, caring for nothing but sensual gratification. They pointed out that the expenses of local public works were unequally and unfairly assessed, oppressively and uneconomically collected by separate collections, and wastefully expended by unskilled and irresponsible officers, and that the existing law for the protection of the public health, and the constitutional machinery for its execution, such as the Courts Leet, have fallen into desuetude.

The commission then went on to state the conditions required for improving the sanitary condition of the laboring classes, which may be summed up as follows :

1. The provision of drainage, the removal of all refuse from habitations, streets, and roads, and the improvement of supplies of water.

2. That as the expense and annoyance of hand labor or carting was the chief obstacle to the immediate removal of decomposing refuse of towns and habitations, they proposed the use of water and self-acting means of removal by improved and cheaper sewers and drains ; adding that refuse when held in suspension in water may be cheaply and innoxiously conveyed to a distance out of towns, and is in the best form to be applied in cultivation, so as to save the fertilizing matters and avoid injury by the pollution of natural streams.

3. That for these purposes, as well as for domestic use, better supplies of water are absolutely necessary.

4. That the expense of public drainage, and public supplies of water laid on in houses, and of means of improved cleansing, would be a pecuniary gain, by diminishing the existing charges attendant on sickness and premature mortality.

5. That skilful civil engineers should be employed to devise and construct new local public works, both to protect the ratepayers against inefficiency and waste, and to insure public confidence that the expenditure will be beneficial.

6. That to avoid the oppressiveness and injustice of levying the whole immediate outlay for such works upon persons who have only short interests in the benefits, the expense should be spread over periods coincident with the benefits.

7. That it would be good economy to appoint, in each district, a specially qualified medical officer, independent of private practice, to examine into the means necessary to prevent disease, and to initiate sanitary measures and reclaim the execution of the law.

The report added :

"The removal of noxious physical circumstances, and the promotion of civic, household, and personal cleanliness, are necessary to the improvement of the moral condition of the population ; for sound morality and refinement in manners and health are not long found coexistent with filthy habits among any class of the community."

This report was thus one of the early fruits of the system of vital statistics which commenced at the accession of the Queen, under the able supervision of our late eminent member, Dr.

Farr. The report itself was drawn up by another eminent member of this Society, Mr. Edwin Chadwick, C.B.

It is a remarkable tribute to the foresight of Mr. Chadwick that, during the last half century, almost all the sanitary principles laid down in the report have been recognized by the Legislature as necessary to the welfare of the community, and have become matters of ordinary practice. The conclusions of the Poor-law commissioners, and the general interest awakened in the subject, led to various sanitary investigations, both by royal commissions and committees of the Houses of Parliament.

SANITARY LEGISLATION DURING THE QUEEN'S REIGN.

When the Registration Act came into operation, an epidemic of small-pox was advancing over this island. It attained its maximum in the spring of 1838, and destroyed 30,819 persons. Dr. Farr mentions that vaccination protected a part of the population, but that there is reason to believe that inoculation led to the extension of the epidemic by diffusing the infection artificially. In 1840 and 1841 the first vaccination acts were passed. These prohibited inoculation, and empowered the guardians to provide means for vaccination, and to charge the expense on the rates ; and enacted that vaccination was not to be considered parochial relief, thus recognizing the fact that the community should bear the cost of measures which are found necessary to secure the public health. It was not, however, till 1853 that vaccination was made compulsory.

The reports of the various commissions and committees of Parliament which inquired into the condition of the people showed the great importance of cleanliness of person and clothing to health, and the difficulties which the poor suffered in respect of it ; and in 1844 private associations, not only in London, but in Manchester, Liverpool, and other large towns, were formed to encourage cleanliness among the working classes by establishing public baths and wash-houses, and lending out pails, brushes, and whitewash to the poor to cleanse their dwellings ; and in 1846 the Bishop of London brought in a general act empowering local authorities to establish public baths and wash-houses, the expense of which was to be defrayed out of the rates.

As regards general sanitary legislation, it is probable that the recommendations in the Poor-law commissioners' report and in the reports of these several royal commissions and committees of the Houses of Parliament, would have remained long in abeyance had it not happened that the nation was threatened with an epidemic of cholera.

In 1832, 1833 the cholera had visited our shores and snatched 16,437 victims. Late in 1845 a great epidemic outbreak of cholera proceeded from Cabul and the north-western provinces of Hindostan as from a centre, swept over Afghanistan, Persia, and the south-eastern portion of Asiatic Turkey in 1846; it advanced in 1847 into Eastern Europe. In 1848 it nearly decimated the cities and towns of the lower Danube, and passed through Austria into Germany and Hanover. Hamburg was attacked on the 7th September, and within three weeks afterward the epidemic reached the shores of Britain, where it first appeared in London on the 22d September, 1848, and in Edinburgh in the beginning of October, 1848.

So long as the unsanitary conditions remain, epidemics invariably haunt the same localities, and the first appearance of the cholera in Bermondsey in 1848 was close to the same ditch in which the earliest fatal cases occurred in 1832. The first case of cholera that occurred in the town of Leith took place in the same house and within a few feet of the very spot from whence the previous epidemic of 1832 commenced its course. On its reappearance in 1848 in the town of Pollockshaws, it snatched its first victim from the same room and the very bed in which it broke out in 1832. It did not, however, attain its full intensity until 1849, and it ceased on the 22d December, 1849. Its progress fully corroborated the report of the Poor-law commissioners. It attacked those towns and houses which offered to it the best inducements to visit them in their filth, decaying refuse, crowded and dirty population, bad water, damp polluted subsoil, or any other of those conditions which lead to bad health in a population, and which, when cholera is absent, afford an evidence of their existence by the prevalence of scarlet-fever, small-pox, typhoid and other fevers, measles, whooping-cough, etc. The total number of victims was 53,293.

The near approach of the cholera led Parliament, in 1848, to the conclusion that :

"Further and more effectual provision ought to be made for improving the sanitary condition of towns and populous places in England and Wales, and it is expedient that the supply of water to such towns and places, and the sewerage, drainage, cleansing, and paving thereof, should, as far as practicable, be placed under one and the same local management and control, subject to general supervision."

An act was passed creating a General Board of Health. The main feature of this act was that when the Registrar-General's returns showed that the number of deaths on an average of the preceding seven years exceeded 23 per 1000, the General Board of Health were empowered to send an inspector to make a public inquiry as to the sewerage, drainage, water-supply, burial-grounds, number and sanitary condition of inhabitants, and local sanitary acts in force ; also as to natural drainage areas, the existing local boundaries, and whether others might be advantageously adopted. The General Board were empowered to issue provisional orders, creating a system of local administration by means of local boards of health, consisting partly of municipal authorities and partly of elected members. These local boards were empowered to appoint necessary officers, including medical officers of health, surveyors, and inspectors of nuisances. The public sewers were vested in the local board, and they were to maintain, cleanse, and regulate the use of sewers. All houses rebuilt were required to be provided with drains approved by the surveyor, and before any new house was commenced the levels of the cellars or lowest floors, and the position and character of the drains or cesspools, was to be approved by the surveyor. The occupation of cellars as dwellings was prohibited. Water-closets or privies and ash-pits were to be provided to all houses and workshops. The local board was also required to manage, repair, and clean the streets, and to provide for removal of refuse. They were to abate nuisances, regulate slaughter-houses, register and make by-laws to regulate common lodging-houses. The local authorities were empowered to provide public recreation-grounds—to provide a water-supply, except where a water

company would supply on reasonable terms. They were also to provide mortuaries ; to obtain power to close burial-grounds which they considered to be unhealthy, and to open new ones. The local boards were empowered to make by-laws and impose penalties, subject to confirmation by the Secretary of State, and to levy rates, to mortgage the rates, and to borrow from the Public Works Loan Commission. The act also provided for sewers, wells, pumps, etc., to be made where desired by the inhabitants in parishes containing less than 2000 persons. The metropolis was exempted from the operation of this act.

The General Board of Health came into existence in 1848, just before the outbreak of cholera in this country, and it took measures at once to check the disease, and proclaimed the principles upon which the preventive and other measures for meeting the epidemic ought to be conducted. Among these measures probably the one which had the greatest effect in promoting subsequently a general feeling of the necessity for sanitary improvements, and which awoke in the nation the needs of moral improvement, was that requiring house-to-house visitation, and the cleansing of the houses and streets, and obtaining an adequate water-supply. This brought into notice the neglected condition of the various localities which the local authorities complacently ignored. One of the inspectors of the General Board of Health remarks :

" I have repeatedly observed that the authorities of one district, while admitting that in other places there might be neglect, affirmed that their parish required little or no amendment. It is one of the great difficulties those who are anxious to ameliorate the condition of the poor experience, that a large part of the influential classes of society know personally so little of the localities and dwellings occupied by them. Many instances have occurred, during the late inquiries, in which, even in country towns, individuals among the higher classes, having been induced to visit the more destitute districts, have expressed their surprise that a condition so miserable as that in which they found their poorer neighbors could have a real existence."

These house-to-house visitations, moreover, prominently exposed the moral and material degradation, and the tendency to crime, engendered by the physical evils concentrated in these wretched dwellings.

The following paragraph, from the report of Mr. G. L. Chesterton, places this in a strong point of view :

"The crowning cause of crime in the metropolis is, however, in my opinion, to be found in the shocking state of the habitations of the poor, their confined and fetid localities, and the consequent necessity for consigning children to the streets for requisite air and exercise. These causes combine to produce a state of frightful demoralization. The absence of cleanliness, of decency, and of all decorum—the disregard of any needful separation of the sexes—the polluting language and the scenes of profligacy hourly occurring, all tend to foster idleness and vicious abandonment."

This epidemic also brought into notice the necessity of appointing efficient medical officers to supervise the sanitary condition of the different towns and districts.

It will not be out of place here to remark that Lord Shaftesbury was one of the first members of the General Board of Health, and that to his untiring efforts, both in Parliament and out of it, much of the improved social condition of the people during the Queen's reign is undoubtedly due.

Further acts for regulating the public health were passed in 1858, 1861, and subsequent years ; and all their provisions were embodied in a general act in 1875, from the operation of which the metropolis was exempted. Subsidiary to these may be mentioned the acts regulating rural water-supply, the Artisans' and Laborers' Dwellings acts, or what have been more recently termed the housing of the working classes, and also acts for checking the adulteration of food, as well as other acts relating to the diseases of animals. This general legislation has been largely supplemented by by-laws issued by local authorities, with the sanction of the Local Government Board, and by means of local acts obtained by various towns.

The act of 1848 initiated the system which subsequent legislation has supplemented, under which many towns and rural districts have borrowed money for and have executed public sanitary works during the last forty years. The importance of this measure may be gauged by the fact that the money borrowed since that time for sanitary works, and not yet repaid, amounts to over £130,000,000, in addition to very large sums spent out of current rates ; and in addition to an

enormous private expenditure, which is beyond the reach of calculation, for the reconstruction of house drains. This legislation and expenditure has caused a complete revolution in that branch of engineering science connected with public health—viz., drainage and water-supply, and has gradually established it on a scientific basis.

Modern sewerage may be said to date from the introduction of oval forms in sewers, by Mr. Roe and Mr. Phillips,* under the Commissioners of Sewers, in 1845 ; the construction of impervious clay pipes for smaller drains ; the recognition of the necessity that sewers and drains should be water-tight and self-cleansing ; and that junctions should be carefully made. Ventilation of the sewers followed a severe outbreak of typhoid-fever, consequent upon the construction of a new unventilated sewer at Croydon. In 1849, 1850 Sir Robert Rawlinson introduced the system of constructing sewers and drains in right lines from point to point, with lamp-holes or manholes at every change of direction or of gradient ; this is now the recognized method of construction among all English-speaking races. The reconstruction of the sewers led to a reform in house drainage, of which the leading characteristics are imperviousness of material, free aeration, and facility of inspection at all points.

The disposal of water-carried sewage began by leading to the widespread pollution of our streams and rivers, and the serious injury of the sea beach in many of our seaside health resorts.

The problem was complicated by the doctrine that as the pollution was caused by a vast amount of fertilizing matter, large profits might be made out of its removal. But those who made this assertion generally overlooked the fact that the conveyance of the refuse would have to be paid for just like any other work.

The subject has been repeatedly discussed, but it is far too extensive for me to enter into here. It may, however, be safely assumed that the water-supply which is delivered pure into a town need not be passed in a foul state into streams or rivers ; and that precipitation of the solid parts in sewage, and

* Mr. Phillips is at present employed in superintending the reconstruction of the drainage of the Houses of Parliament.

passing the liquid through land, are eminently fitted, when properly applied, to produce a purified effluent at a certain cost ; consequently, if certain conditions of population and of sewage were always observed, each district could be made self-contained in respect of its sewage just as it can be in respect of its cemetery ; and it is probably wiser to spend money raised by rates on removing the solid matter, filtering the liquid through land, and employing labor on the land to produce a certain quantity of food to be sold, rather than to spend the rates in paying interest on a large capital expenditure for works necessary to convey the sewage to a distance, where its value would be entirely lost.

Similarly in regard to water-supply, our advance in mechanical skill has facilitated the almost universal introduction of water to houses in towns, by which the habits of the laboring population have been materially altered ; and the constant service has led to numerous alterations and improvements. But with our present population the question of obtaining purity of supply has assumed a paramount position.

The cholera epidemic first awakened the public to the dangers of impurity ; but the continually increasing population on our small island is daily adding to the surface pollution of the country, and compels us to employ the highest science of the chemist, the physiologist, and the engineer which the country affords, both to ascertain the degree of purity and to devise methods of purification.

THE METROPOLIS.

Let us now turn from the community generally to the metropolis, which was excluded from the operation of the sanitary acts of 1848 and 1875. The population of London was 960,000 in 1801. At the Queen's accession it had more than doubled, and amounted to about 1,900,000. At the present time it is very nearly 4,000,000. The metropolis has, from its situation, all the attributes of a healthy city. It lies in a valley through the centre of which the Thames sweeps from west to east, and the winds rushing over its water afford a continuous supply of fresh air to the middle of the city. But the advantages of this situation had been largely frustrated by the unopposed efforts of the landowners to accumu-

late the greatest possible number of houses on the least possible space, by which the free circulation of air was impeded in some districts, and the families of artisans were crowded in small, low, close rooms, without space for the safe retention of refuse ; and there was no adequate machinery for its rapid removal.

London is now undoubtedly the finest capital in the world. It was far from being so at the beginning of the Queen's reign. The Houses of Parliament were not completed. Buckingham Palace consisted of a centre and two wings, while the Marble Arch, now at the corner of Oxford Street, stood like a sentry-box in front. Between Piccadilly and Covent Garden there was a network of narrow alleys and streets, and dense masses of population were crowded together in various parts of London in what were termed "rookeries," where it was dangerous to penetrate. The city streets were narrow and crowded. Smithfield Market, filled with thousands of animals, formed an impassable barrier between east and west on most mornings.

Beyond Knightsbridge were fields and villas ; Kensington, Hampstead, and Dulwich were detached villages. Norwood and Sydenham had barely come into existence.

Open privies, cesspools, and untrapped drains were spread over the whole of the metropolis, poisoning the surrounding atmosphere with their volatile exhalations.

In the poorer districts the backyards of the houses were dirty, sodden, and ill-paved ; the only attempt made at paving was often by means of loose, broken pieces of stones or bricks ; the holes in which they were placed became the receptacles of foul water, defying all attempts at cleanliness.

The absence of dust-bins was very general ; one corner of a small yard generally served for the purpose of depositing house refuse, which was often allowed to accumulate for weeks, or even months.

There were deplorable deficiencies in the sewerage. The drainage found its way through badly-formed, leaky drains into the old water-courses, and thence to the river ; the sewage was floated up and down by the tide in the heart of London, until it was deposited on the shore at low water in fetid banks which covered the foreshore from Blackfriars to Battersea.

Before the Queen's accession some improvements had been commenced, and others had been projected; but the more pressing of the then requirements are summed up in the following extract from Dr. Farr's report to the Registrar-General on the death causes of 1838:

"The careful exclusion of all unnecessary animal and vegetable matter; the immediate removal of all residual products; and the dilution of inevitable exhalations. The dead should no longer be buried where they are surrounded by crowded dwellings. Unwholesome manufactories should be excluded from densely peopled districts, and there is assuredly no reason why thousands of cattle, sheep, horses, animals of every kind—sometimes affected with epizootic diseases—should be gathered together in market-places within the city, or slaughtered in houses where the blood and offal can never be effectually removed."

Dr. Farr remarks that this unsatisfactory state of things was due, in no small degree, to imperfect laws, or to the machinery by which the laws were worked. Outside the city London had no municipal government; it was an aggregation of parishes, each governed by its own vestry. The streams and sewers were controlled by the Commissioners of Sewers, formed originally for purposes of land drainage. There was no accurate map of London or of its levels. The inconvenience of the divided jurisdiction in respect of roads had been felt earlier, and the metropolitan roads had been united under a special commission some years before. There was no general rating for metropolitan improvements. These improvements were made partly at the expense of the Crown and partly out of funds voted by Parliament, in which case the money was generally borrowed on the security of coal and wine dues. The work was done under the control of the Commissioners of Woods and Forests. Regent Street, with Waterloo Place, had been formed some twenty years previously under his Majesty George IV. when regent. Victoria and Battersea parks were formed early in the Queen's reign, also Coventry Street, and many other streets which it is unnecessary to enumerate.

In 1846 a new Commission of Sewers was formed, and charged with the duty of revising the metropolitan drainage. The commissioners applied for an ordnance survey of the metropolis, which was commenced in 1847.

The water-supply of London was furnished by water companies, who trenched upon each other's districts. Its volume may be assumed, at the Queen's accession, to have been about 36,000,000 gallons per twenty-four hours. It was estimated by Mr. Wicksteed, in 1845, at 45,000,000 gallons. Some was derived from the tidal part of the Thames, and was more or less filtered ; but, from its doubtful purity, pumps in surface wells, often adjacent to churchyards, were frequently preferred for drinking water. In many of the courts and smaller streets water was obtained only from a small stand-pipe, where the water was turned on for an hour or less daily, when the inhabitants stood around waiting with whatever vessels they might have at hand for their turn to procure a portion of a miserably scanty supply, which was then stored for use in probably the only room occupied by a whole family. Among the poorer classes, almost the only receptacles that existed were wooden butts, frequently in a state of decay ; and as they were for the most part without covers, the water was placed under favorable circumstances for the reception of dirt and refuse and for the development of animal and vegetable growths.

After the cholera epidemic the question of the purity and quantity of the water-supply attracted notice, and in 1852 Parliament passed an act forbidding the supply of water from the tidal part of the Thames or its tributaries, and requiring all river water to be filtered and to be kept covered after filtration ; also requiring a constant service when demanded by four fifths of the houses in a district. In 1858 the average daily supply had risen to 75,000,000 gallons. In 1871 another general act was passed, to make further provisions for securing to the metropolis a constant supply of pure water ; this act defined the sources of supply of the several companies, and required, among other matters, efficient filtration and the application of tests of purity.

The amount of water delivered into London by the water companies for September last was 178,196,597 gallons in twenty-four hours, of which about 90,000,000 gallons came from the Thames above Teddington Lock ; its purity is ascertained by continual analysis ; and it may now be said that the water supplied to London rivals that of any other city in purity.

It was not till 1852 that the Secretary of State was authorized to prohibit burials within the metropolis.

A new era in metropolitan sanitation was inaugurated in 1855. In that year the Metropolitan Board of Works was created. In this body was vested the main drainage of the metropolis, but the charge of the subsidiary parish sewers was left to the vestries, who were also charged with the care of the streets and roads, the Metropolitan Roads Commission being abolished, and all duties of lighting, control of removal of refuse, etc., were placed on the vestries.

Thus the formation of this new board was somewhat of a retrograde movement, because the concentration of functions, which had been commenced under the Metropolitan Roads Commission and Metropolitan Sewers Commission, instead of being strengthened in the new board, was abandoned, and something approaching chaos was introduced. This board has, however, by degrees had remitted to it the care of London improvements and certain other general municipal functions, as well as power to levy general rates. The city retained its individuality, excepting as to the main sewers, and effected improvements and opened out thoroughfares in the part under its jurisdiction. The improvements in the other parts of London are mainly due to the action of the Metropolitan Board of Works. Great alterations have taken place in our thoroughfares ; indeed, Regent Street is the only important thoroughfare which has not undergone an almost complete transformation during the Queen's reign. Smithfield Market for live cattle has been abolished. Many of those large tracts of London which were occupied by dwellings of the most wretched description are now traversed by wide thoroughfares and covered by artisans' dwellings erected by private enterprise. But there is no diminution of the rate at which the vast aggregation of population in London still continues to progress, and, unfortunately, many of the wretched crowded dwellings still remain, where those born in close rooms, brought up in narrow streets, and early made familiar with vice, are deteriorated in physique, and grow poorer from inability to work.

The reconstruction of the drains, the removal of the sewage from the midst of the population, the opening out of thorough-

fares, so as to admit ventilation into crowded districts, have all tended to improve the sanitary condition of London.

The death-rate of London in the five years 1838–42 was 25.57 per 1000. In the five years 1880–84 it was 21.01 per 1000; and the deaths from zymotic diseases, which in the decade 1841–50 had averaged annually 5.29 per 1000, were reduced in the years 1880–84 to 3.4 per 1000. If, however, we assume that there had been no change in sanitary conditions, and therefore that the death-rate had gone on increasing according to Dr. Farr's formula of increase due to density of population when the sanitary conditions remain unchanged, the death-rate of 1880–84 would have averaged 26.62 per 1000 —that is, a saving of 5.61 per 1000 has been effected by sanitary measures.*

If upon this basis we compare the saving in life which has resulted from sanitary improvements at different periods since 1838–42, we find that it amounted to an annual saving of 4604 lives during 1860–70; of 13,929 lives annually during 1870–80; and of 21,847 lives annually between 1880–84. The main drainage works were commenced about 1860, and terminated in 1878, and the increase in the saving of life in these consecutive periods may to some extent be taken as a gauge of the effect of the gradual construction and completion of these works. No doubt this London death-rate is far too high, and is an evidence that unsanitary conditions still prevail all round us, that the housing of the working classes is still far from satisfactory, and that we are too careless about infectious disease. The Metropolitan Board of Works has never had a clear field for municipal action; yet when we compare the present condition of London with what it was at the Queen's accession, the Metropolitan Board of Works, in spite of the

* The mortality was calculated from the formula—

$$m' = m \left(\frac{D'}{D}\right)^{0\cdot11998}$$

which Dr. Farr found to express approximately the relative increase of density and mortality (see "Supplement to Registrar-General's 35th Annual Report," pp. 24, 158). In this instance, m is the symbol for the average annual mortality in the five years 1838-42, and D the mean density of population in the same period, while D′ represents the mean density in the five years 1880–84, and m' the calculated mortality in this quinquennium.

disadvantages of its constitution, will have a grand record to show, in the jubilee year of the Queen's reign, of metropolitan improvements and metropolitan sanitation.

GENERAL RESULTS OF THE SANITARY LEGISLATION ON THE WELL-BEING OF THE PEOPLE.

The main principle which guided public administration, both before and during the earlier years of the Queen's reign, may be said to have been that of non-interference, and of allowing free competition to prevail; although, no doubt, some efforts had been previously made to regulate the labor of females and children in factory acts.

The practical application of the knowledge derived from the Registrar-General's statistics led to further investigation in particular cases by such men as Dr. Simon, Dr. Buchanan, Sir Robert Rawlinson, and others, and gradually caused a reaction from what may be called the *laissez faire* system, to the spread of opinion in the direction of control over individual action in the interest of the community generally; and the result was the enactment of the successive laws for regulating the sanitary condition of the people, which I have enumerated above.

This large amount of legislation is practically little more than the interpretation required by the increase of population, and by the complicated exigencies of modern life, of the common law maxims, *Prohibetur ne quis faciet in suo quod nocere possit alieno;* and *sic utere tuo ut alienum non lædas*—that is to say, no man shall do anything by which his neighbor may be injuriously affected, and each person must so use his property and his rights as not to harm any one else.

This common law doctrine had become practically obsolete, because there was no machinery in existence to enforce it; and the present generation inherited a legacy of misery among the poor classes, owing to the absence of regulations in the building of houses as the towns increased in size, absence of water-supply and drainage, and other matters which I have mentioned.

The death-rate of 1838–42 for England and Wales was 22.07 per 1000; that of 1880–84 was 19.62 per 1000; and the deaths from zymotic disease, which averaged 4.52 per 1000 in the

decade 1841–50, were reduced to 2.71 per 1000 in the years 1880–84. It is, however, curious to note that the improvement in urban districts does not appear to have kept pace with that in rural districts, for it appears that while the deaths from zymotic disease in certain urban districts have declined from 5.89 per 1000 in the decade 1851–60 to 5.12 per 1000 in the decade 1871–80, the deaths from zymotic disease in rural districts in the same interval have declined from 2.77 to 1.67 per 1000.

In order to form an estimate of the saving of life due to sanitary measures, we may assume that sanitation remained in abeyance, and calculate what the death-rate, according to Dr. Farr's formula, would have been in consequence of increased density of population, and compare that with the actual death-rate ; upon this assumption we find that the sanitary improvements only began to tell after the cholera epidemic of 1848–49. In the decade 1841–50, indeed, it appears that the death-rate was actually larger than that due to the increased density of population. But in the following decade the sanitary improvements began to produce their effect, and this effect has gradually increased. In the decade 1850–60 the annual average saving of lives in England and Wales from sanitary improvements was 7789 ; in the decade 1860–70, it rose to 10,481 ; in the decade 1870–80, it was 48,443 ; and in the five years 1880–84, the average annual number of lives saved by sanitary improvements have been 102,240.

The present social condition of the people affords an equally striking evidence of general improvement. Food and clothing are cheap ; the construction of streets and new buildings in our towns are regulated ; houses are improved ; overcrowding and cellar dwellings are prohibited ; the common lodging-houses are controlled. Petroleum affords a brilliant light to the poor in country districts which are beyond the reach of gas or of the electric light, and who were formerly dependent on rushlights. Water-supply is rarely deficient ; removal of refuse is enforced. But there remains much still to be done. Numbers of the people are still crowded in wretched dwellings ; our rivers are polluted and subject to floods ; our infectious diseases are not properly cared for.

The main feature of the legislation of the past half century

is the recognition of the principle that when large numbers are congregated together in communities, the duty of preventing injury from this aggregation rests on the community; and if this principle is duly acted on, if in all aggregations of population free circulation of air is encouraged by preventing the crowding together of buildings; if refuse is immediately disposed of, so as to cause no injury to any one; if pure water be provided; if we isolate infectious diseases; and above all, if we are fortunate enough to retain the blessing of cheap food and clothing, we shall not transmit to our posterity a similar legacy of misery to that which we inherited.

SANITARY IMPROVEMENT OF THE ARMY AND OF INDIA.

In this brief summary I have only been able to sketch out the sanitary conditions of the civil population in this island. But that sketch leaves untouched some of the most important features in the progress of sanitation during the Queen's reign.

In the army, between 1844 and 1854, the death-rate of the British soldiers, who were selected lives, was 17 or 18 per 1000 during peace at home stations, as compared with a calculated death-rate of 8 per 1000 of the lives of the civil population at similar ages. After the Crimean War the exertions of Sidney Herbert, Miss Florence Nightingale, Dr. Sutherland, and others, led to great improvements in the lodging, food, dress, and general management of the soldier, and during 1885 the army death-rate at home stations did not exceed 5 per 1000; this means the annual saving in peace time of three whole regiments. Considering that the soldier's life is carefully selected, and that his period of service is shortened, this death-rate in peace time is still too high.

In the British army in India, before the Crimean War, a death-rate prevailed of 60 and 70 per 1000—that is to say, that with an army of 60,000 men, between 3000 and 4000 men had to be sent out yearly in peace time to replace the loss. This, by means of improved attention to the soldiers' lodging, clothing, food, and other matters, has been reduced to between 15 and 17 per 1000. Moreover, the inquiry into the health and the condition of the British army in India led to a consideration of the defective sanitary condition of the civil

population, and was followed by the creation of a sanitary organization throughout the Queen's empire in India, which is leading to a vast improvement in the sanitary condition of the native population.

CONCLUSION.

The changes which have taken place in the last fifty years in every branch of life, social, political, and commercial, will make the reign of Queen Victoria ever stand out as an important historical epoch. In respect of sanitation, she found that the old systems, designed to regulate the sanitary condition of the people in simpler times for a small population, no longer met the exigencies of our crowded cities and more complicated habits of life.

If time had permitted, I should have liked to dwell on the economic and social considerations involved in the saving of life which has thus been effected in every branch of the population, and in every part of the Queen's empire. It implies the diminution of disease, with its consequent pain and misery, and a raised physical condition of the people. It has carried with it a higher social standard and improved morality, and has diffused a large measure of happiness throughout the nation.

Dry Heat and Steam as Disinfectants.—At the request of the German Government, Koch and Wolfhurzel experimented upon the comparative disinfecting value of dry heat and steam. They reported that, by the direct application of steam at 212° Fahrenheit for from five to ten minutes, even the virulence of dried anthrax blood was destroyed. Earth-spores, which have a reputation for tenacity of life at high temperatures beyond all others, were devitalized by fifteen minutes' exposure to steam, while they resisted the action of dry heat for three or four hours at 302° Fahrenheit.

Dr. Russell, medical officer of Glasgow, says that, during the last ten years, over a million of articles (from persons affected with every kind of contagion known in this country) have passed through the Glasgow laundry, and that he has never known a case of interchanged disease, although the women engaged in the laundry have occasionally suffered from handling the linen before the boiling process.—*Dr. Ellister, in British Medical Journal.*

THE RELATIONS OF TEMPERATURE TO HEALTH IN DWELLING-HOUSES.*

By D. Benjamin, M.D., Camden, N. J.

What is generally called a cold is always produced by some change of temperature, with or without moisture, to which a part or the whole of the person has been exposed. In most cases the change must be from a given temperature to a lower one in order to produce a cold. One is more apt to take cold if a part and not the entire body be exposed to a low temperature. Dampness adds greatly to the power of a low temperature to produce a cold.

A cold is a disturbance of the circulation of the blood, whereby a part of the body has too little blood in it, and, therefore, some other part has too much.

The part that has too much is said to be congested, and if the congestion is not promptly relieved by treatment inflammation is sure to follow. If in the throat, croup ; lungs, pneumonia ; bladder, cystitis, etc.

The human flesh is elastic and contractile, and, therefore, when cold is applied to a part it contracts, holding much less blood ; consequently, some other part must contain more than it should. Moreover, all vital action goes on more slowly in a low than in a high temperature, so that by cooling a part overmuch its nerve energy and vital force are greatly affected, causing delayed and dangerous reaction, or actual destruction of a part ; while the undue blood in some other part of the body lights up inflammation that would not have been called into existence without this stimulus.

Cold applied to the skin generally produces congestion of the mucous membranes, because of their similarity of construction, nerve supply, and continuity of structure to the skin.

* Revised from "Some Observations on the Relation of Dwelling-House Windows and Temperatures to Acute Inflammatory Diseases," in the *Medical Bulletin*, May, 1886.

The most healthful temperature for the human body to live in is about 70° Fahr.

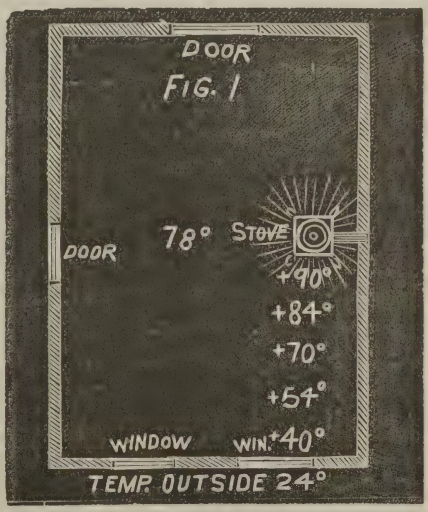
In a slowly moving atmosphere at 70° Fahr. a person cannot take cold; but a change of 10° Fahr., especially if it is sudden, is often sufficient to cause one to take cold.

The foregoing are undeniable truths, based on physiology, chemistry, and physics. Their importance and the practical application of them, especially in the prevention and treatment of diseases of the respiratory organs, we will now consider.

A few years ago I began making some observations and experiments on the circulation and temperature of air in rooms, with results which appear to me to be of practical importance.

The conditions of temperature and circulation of air vary greatly in rooms, especially those that are in use.

Fig. 1 gives results of experiments in a room ten feet high, twelve feet wide, and twenty feet long, with a good stove and steady fire. Three-story brick house, south front, twelve rooms, warm cellar. Out-door temperature 24° Fahr. By examination of Fig. 1, it will be seen that when the centre of a room is 78° Fahr., four feet from the window it may be 70° Fahr., one foot from window 54° Fahr., and at window 40° Fahr. (no doors or windows having been opened for thirty minutes), a difference in the room of 38° Fahr.



In Fig. 2, a vertical section of same room, it will be seen that while the head is in 75° Fahr. the feet may be in 50° Fahr. What must be the effect on a person who removes his warm boots and wears slippers, or the one that lies down to sleep on such a floor? Many do these very things, however.

Fig. 3 shows an every-day occurrence among thousands,

yes, millions of people. A child three or four years old, from playing near a stove or on a nurse's lap, in a temperature of 70° or 80° Fahr., perhaps in a sweat, goes to a window and stands, without any change of clothing or protection, for half an hour or more, in a temperature anywhere from 30° to 55° Fahr. How such a thing can occur without resulting in croup or pneumonia must be marvellous to any one who studies the subject even casually.

In many instances there is a small crack or opening either under the sash or at the side, and almost always at the junction of the upper and lower sash, where a stream of air is passing into the room nearly as cold as the outside air, though it be below zero. Cold air at a high speed striking a child directly on bare throat or breast can seldom fail to produce some dreadful disease.

On a very cold day, in some of the wooden houses inhabited by poor people with many children and little time to look after them, children may often be found sitting on the floor in a temperature of 38° Fahr., or standing with nose against window-pane at 20° Fahr., when the mother is washing or ironing in 65° Fahr. These people generally have but one fire in the house, and that in a cook-stove, which cannot heat the floor at all, while cold drafts come from every other room, and especially from the stairway.

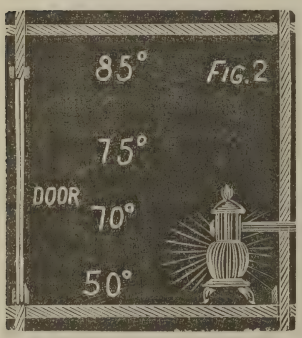


FIG. 2

In churches and theatres the galleries will be 85° to 90° when the floor is 70° Fahr.; then the opening of a door or window is very injurious, and going out into the air at 10° or 20° Fahr. also causes a dangerous strain on the system.

In view of the principle already given, it seems to me that this is a striking state of affairs, and perhaps no principles of hygiene are so grossly violated as these. No wonder that the death list in Philadelphia alone in a single year reaches the dreadful sum of one thousand from pneumonia and about four hundred from croup (preventable diseases in most cases). It is also somewhat remarkable that the subject has not before been written up in medical works. The thermometry of

hygiene and the sick-room is a fruitful field for cultivation.

By reference to cuts, it may be seen that it is easy to be exposed in five seconds to a change of 40° Fahr., a circumstance that can never occur out of doors. In open air the temperature is nearly the same from head to foot, and changes much more slowly than in the house. A child gets off the bed and sits on the floor, a change of 10° Fahr., it may be 20° Fahr., or it goes to the window, possibly to scratch in the beautiful frostwork on the glass, a change sometimes of 40° Fahr. This explains why people take cold more frequently in the house than they do out of doors. In fact, I do not believe that people will take cold by habitually going out if they exercise and are properly clothed.

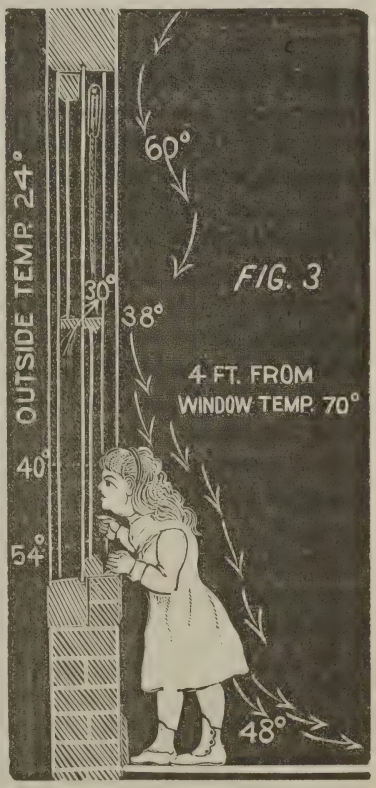


FIG. 3

By reference to Fig. 4 it will be seen that when the first floor was as low as 48° and 50° Fahr., the second floor was 65° Fahr., and all the second floor room was of a more even temperature. This is owing, of course, to the cold under the first floor, and the heat 90° Fahr. under the second. It shows why the sick should be, if possible, in the second story, over a room that is heated, and why relapses occur when patients are permitted to come downstairs. The contrast is greater in many instances than shown in the figure, which represents a grade of houses better than the medium.

Most of the foregoing experiments may be performed as follows: Take one and a half dozen thermometers (common Japanned tin cases), set them in water very cold, 33° Fahr.,

and well stirred ; ascertain the difference in the register, if any, and note it by pasting a little slip of paper with the correction on it near the top. Then place the thermometers all in water at 120° Fahr., well stirred, and correct as before ; then in water at 70° Fahr., and correct. These corrections will render them sufficiently accurate for practical purposes. Lay six of them across the floor, or, better, on blocks one half an inch high, in a row, equally distant one from the other, extending from wall to wall ; then stretch a string or wire across the room in the same vertical plane as the row of thermometers, and hang another row on it right above the first ; stretch another row across in same plane at ceiling. You will then have three horizontal rows and six vertical rows. Wait thirty minutes, then read off the temperatures, and record them on a piece of paper to represent the vertical section of room. Any number of such sections may be made in a room, and should be made to include windows and doors as a main feature. Temperature of windows can very easily be taken by placing or hanging thermometers on the sash.

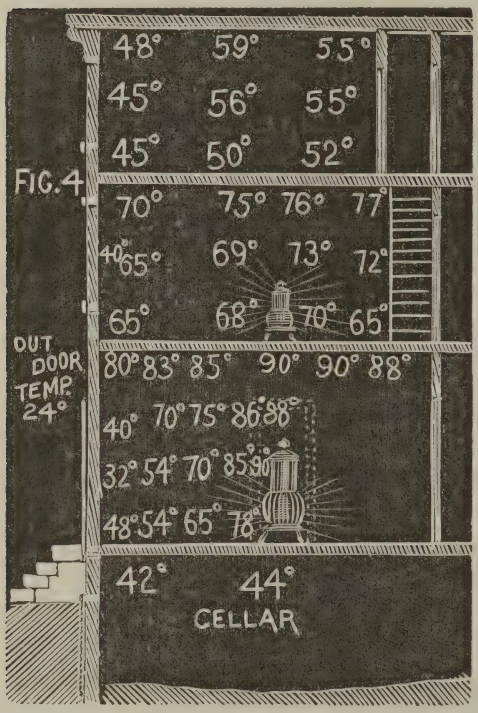


FIG. 4.

It is clear from what has been stated that to keep well or to treat diseases, especially of the respiratory organs, such as pneumonia, croup, pleurisy, bronchitis, coryza, etc., we should keep an even temperature of about 70° Fahr. The thermometer should be on a level with the patient's head and near by ; a good way is to hang it on the bedpost at the head of the bed,

and the mercury should not be allowed to fall below 68° Fahr., or rise above 74° Fahr. If the floor is warm, the whole room can easily be kept so.

A bed should not be against a cold wall. If it cannot be in the middle of the room, it should not be near a window or door, and should always be pulled out from the wall six inches or more, so that the cold air, which always descends along a wall, can have room to drop to the floor without flowing over the bed. A great many cases of rheumatism and neuralgia come from sitting near a window.

I have often tried lecturing parents and nurses about the importance of keeping children away from windows, but it is very often impossible to have the instructions obeyed. Windows are very attractive to children, especially when the weather is too severe for them to play out. Any woman's mind would be dreadfully strained who has her housekeeping to attend to if she were compelled to keep her eyes constantly on a number of children, even if she could compel them to obey when detected.

Some years ago I devised a contrivance to protect children from the death-dealing windows in cold weather, which has given me, as well as parents, much satisfaction. It is simply a fender of metal (also made of wood) about three feet high, and extending out from the window fifteen or twenty inches.*

In some families where I have had these screens arranged to the windows for one or two years, I have reduced the medical attendance very greatly, as my books will show.

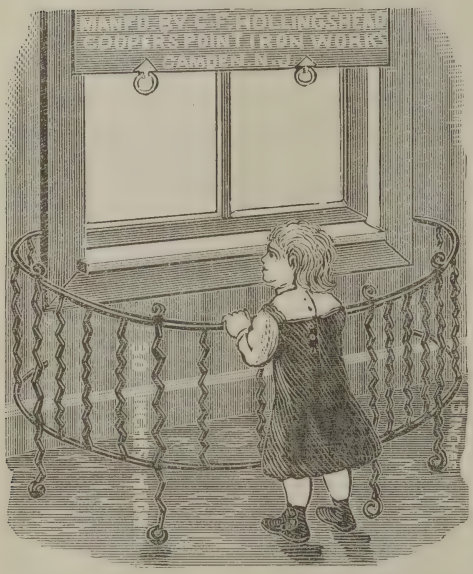
In Canada many of the dwelling-houses have double sash, glass about four or five inches apart, a very good device, and one that diminishes the coal bill also. They are a little unhandy to keep clean.

About two thousand cubic feet of fresh air is needed per hour for each individual in a room, and when no fresh-air registers are provided, can only be supplied through the keyholes and cracks around doors and windows, making necessarily strong and dangerous draughts. The only resource left the physician, therefore, is the making of strenuous efforts to have people keep away from the dangerous places.

* At my request Mr. C. F. Hollingshead, of the Cooper's Point Iron Works, has prepared some very convenient and ornamental designs.

Leaving bedroom doors ajar or windows slightly raised in cold weather is sometimes dangerous, on account of draughts, and though it may be occasionally necessary, it generally requires more knowledge of sanitary science than is possessed by the masses.

On being called to see a case, I rarely find a thermometer in the sick-room ; its importance is not realized by the laity (or the profession). If there is one about it is out of doors, or often good for nothing. The amount of ignorance in regard to the thermometer is remarkable. I often find people using one that is broken, and working against the pressure of the atmosphere instead of a vacuum. Once a lady said to me on my second visit : "Doctor, I don't see as that theomiter is any good ; I've been a-watchin' it, and I had to use more coal to keep the room warm than afore I got it ; I gist might as well a-throwed the money away." Still, I am in the habit of ordering a thermometer with the first prescription, though many would apparently pay five dollars for medicine more freely than twenty-five cents for a thermometer, that might save ten times that amount.



No one can tell by his own feelings whether a room is warm or cold, for often you will see two persons contending in the same room, one that it is too warm, and the other that it is too cool. It is obvious that we cannot regulate for invalids or others by our feelings. The only unerring guide is the silent, sensitive little column of mercury.

The more rooms that are kept heated in a house the less draughts will be found. Especially heat the halls ; it will not

take much more coal, and will avoid forcing your heaters or stoves, and enable you to keep easy fires; keep the cold air from under the house also.

The artificial life of civilization causes greater susceptibility to colds at the same time that it exposes us to greater changes of temperature; but science enables us, on the other hand, to oppose with some success these pernicious influences. The study of this subject shows not only the varied principles that lie at the foundation of successful practice, but also the importance of the collateral sciences to medical education. And it is believed that even the few suggestions of this paper, if properly applied, would reduce the amount of sickness and death consequent upon the habitual neglect of easy precautions.

REPORT OF THE COMMITTEE ON HYGIENE—MEDICAL SOCIETY OF THE STATE OF NEW YORK.

HYGIENE OF THE PUBLIC INSTITUTIONS.

AT the recent meeting of the New York State Medical Society, February 2d, Dr. E. V. Stoddard, of Rochester, Chairman of the Committee on Hygiene, submitted the following report:

To the Medical Society of the State of New York.

GENTLEMEN: Your Committee on Hygiene respectfully report that, during the past year, the attention of this committee has been devoted to completing observations in the line of the sanitary condition of the State. The reports from the various counties, in response to the circular issued last year, have been so imperfect that much individual work on the part of the members of the committee has been necessary. It is believed that the failure to maintain a committee on hygiene in many of the county societies is a source of apathy on sanitary questions among the profession and the public in such counties; and we embrace the present occasion for urging the formation of an active committee on hygiene in every county society.

The subjects of special inquiry have been: "The *sanitary condition of the public institutions of this State:* 1. The *char-*

acter of the site ; 2. The *provisions for heating and ventilation ;* 3. The *source of water-supply ;* 4. The *provisions for bathing* the inmates ; 5. The *mode of excreta removal ;* and, 6. The *number of inmates* in the institution, and the *provision of air space* for each *by day* and *by night.*"

From several counties carefully prepared reports have been sent in reply to the circular issued ; but from more than half the counties of the State no information has been received. In these latter it has been necessary for the members of this committee to secure such information as might be possible by their own individual effort and observation. As a result we are enabled to present a *résumé* of the subject, which is gathered from nearly every county in the State.

That there should be great diversity in the condition of the institutions of the several counties is readily conceived. In some the sanitary condition is reported to be excellent, in others very poor in many, if not in most, respects.

The principal feature noted, which is very nearly constant, is *crowding*, from insufficient accommodations. The matter of food and water-supply is fairly regulated in the great majority, yet water-supply is very frequently wholly inadequate in quantity, and often not above suspicion in quality.

Provisions for heating in many are sufficient and ample, in others inadequate, and in some cases not to be tolerated. Yet a tendency to improvement is very generally apparent in this direction. The subject of personal hygiene of inmates, and especially of bathing, has been carefully investigated, and it has been found that great improvements have been made in this respect during the past three or four years. Where formerly no compulsory bathing took place, or where, if it did, a number of persons were bathed in the same tub and water, without change, this latter is not detected, and more systematic efforts in the line of bathing are general.

Your committee report with pleasure the improvements in both the internal and external hygiene of the public institutions coming directly under the observation and influence of the State Board of Charities. This organization has, during the past five years, corrected many abuses and instituted many sanitary changes, which have gone far to remove some of the most unhygienic aspects of our public charities.

A more extended interest in and co-operation with such measures is desired from the medical profession.

In our penal and reformatory institutions similar observations are made. The Prison Association has, like the State Board of Charities, been able recently to work some sanitary reforms, which have been *greatly* needed. There is, however, much yet remaining to be done, and this committee would again take occasion to point to the necessity of an active movement by the members of this society in this direction.

In conclusion, your committee would report both a real and prospective improvement in the sanitary condition of the public institutions of the State; yet such improvement is necessarily slow and dependent upon a better educated public opinion, to be achieved by effort of the medical profession mainly and sustained by legislation.

The following contributions to this report are appended as given:

"Report upon the Sanitary Condition of the Public Institutions of Herkimer County," by C. W. Hamlin, M.D., Chairman; "Report of the Committee on Hygiene of the County of New York," by E. H. Janes, M.D., Chairman; "*Hospitals for Contagious Diseases in Brooklyn*"—proposed act by the Health Department.

All of which is respectfully submitted.

E. V. STODDARD, M.D., Chairman.

COMMITTEE: E. V. Stoddard, M.D.; A. N. Bell, M.D.; W. H. Bailey, M.D.; F. C. Curtis, M.D.; E. Hutchinson, M.D.; J. W. Crevelling, M.D.; J. W. Loughran, M.D.

THE SANITARY CONDITION OF THE PUBLIC INSTITUTIONS OF HERKIMER COUNTY.

The Herkimer County Almshouse is situated upon a farm of sixty-three acres in the valley of the West Canada Creek, six and one half miles north from Herkimer, and one and one half miles south from Middleville, and upon the Herkimer, Newport and Poland Narrow Gauge Railway, there being a station upon the premises. Its immediate presence is upon a southern slope, and about one hundred rods west of the creek and at an elevation of about fifty feet above the bed of the stream. The soil is of a gravelly loam, underlaid by coarser gravel and hard-pan.

The main building is built of brick, four stories high, including the basement, and covered with a tin roof. An additional stone building stands in the rear of the main building, and attached to it, which is two stories above the basement. The main building is divided into three distinct apartments, the centre being occupied by the superintendent and his family, and on either side are the male and female wards. In the stone building the basement is devoted to a kitchen, bakery, and laundry. The second and third stories are occupied by male inmates, mostly insane.

The dimensions of the main building are 160 feet long, 50 feet wide, and 10½, 10, and 9 feet between joints in the clear, respectively.

The stone building is 50 by 39 feet, and 10 feet in the clear between joints. In the rear of the building is a large yard surrounded by a high, tight, board fence, and partitioned off near the centre to separate the sexes, to which the inmates have free access. From the rising ground in the rear of the yard the inmates are enabled to get a view up and down the valley. The buildings were erected in 1880, and a thorough system of drainage adopted. The main sewer is eight inches in diameter in the clear and, commencing at the north end of the main building, runs its entire length, thence across the yard and meadow, and terminates at the top of a bluff toward the creek and about fifty rods distant. Into this all the pipes from water-closets, laundry, kitchen, etc., empty. All openings into the main sewer are protected by traps, but neither the traps nor pipes are ventilated. Some trouble was at first experienced by some of the pipes becoming furred, and thus clogged up ; but by the occasional turning into them a jet of live steam the difficulty was overcome.

The heating of the building is entirely by steam, and much of the cooking and laundrying is done by the same agency. Originally the indirect system of heating was adopted in the insane wards, but it was found to be much more expensive and much less efficient, and after an experience of two winters was changed to direct heating, the system now adopted throughout the entire building, and with perfect satisfaction.

Connected with the system of heating is that of ventilation. From all the rooms occupied by inmates there are openings into ventilating tubes, these tubes extending up

into the attic, and from there there are openings through the roof by several shuttered ventilators. In each of the ventilating tubes there is located a steam pipe, terminating in the attic, thus heating the column of air and creating a current at all times when there is a fire in the boilers. Practically the ventilation is a fair success, and foul odors are but very rarely discernible in any part of the buildings.

The water-supply is derived from living springs, near which is a sufficiently large reservoir for storage purposes ; also from a small spring brook, upon which there is built a stone dam ; and from the roof of the building. In the third story of the brick building there are four cisterns of about one hundred and twenty barrels capacity, and in the basement two more of about six hundred barrels capacity. The overflow from these is conducted into the sewer pipes, and such overflow is nearly constant. The cisterns in the third story are supplied from the roof, and to keep them full a steam-pump is used to force water from the cisterns in the cellar to them when necessary. Several small cisterns are constructed over those water-closets most in use, for the sole purpose of removing the excreta from them.

Suitable arrangements are made and hose-pipe constantly attached to the cisterns in the attic for fire purposes, and also hose-pipe is kept in close proximity to the steam-pump in the basement for similar use.

The supply of water is ample for the use of the house and stock, and two fountains on the lawn are playing constantly during the summer. The water has never been scientifically examined, but is apparently wholesome and free from pollutions of any kind.

The provisions for bathing the inmates are ample. There are six bath-tubs used by them, one located on the first and second floors of both male and female departments in the brick building, and one on each floor of the stone building. All inmates are required to take a bath at least once a week, and only one person uses the same water. The water is warmed when necessary by a jet of steam projected into it in the bath-tub.

The average number of inmates in the institution during the past year has been one hundred and nine. They occupy

the first floor during the day, and the average amount of air space to each is about six hundred cubic feet. The third and fourth floors are mostly devoted to sleeping-rooms, each of which contain from six to eight beds. The average amount of air space to each person during the night is about nine hundred and seventy-five cubic feet.

On the second floor of the brick building there is a large room in each department devoted to hospital purposes, each containing four beds. The amount of air space in each is twenty-five hundred cubic feet. Rarely has there been more than three patients in either at a time, and an average of less than two each.

The dining-rooms are on the first floor of the brick building, and adjoining the kitchen in the basement of the stone building. The sexes occupy separate rooms, and they are of sufficient size to accommodate all the inmates at the same time. A dietary table is used, of which the following is a copy :

	Breakfast.	Dinner.	Supper.
Sunday.....	Hashed Meat. Boiled Potatoes. Bread and Coffee.	Vegetable Soup. Fresh Beef. Potatoes. Bread, Butter and Tea.	Bread and Tea, or Bread and Milk.
Monday.....	Stewed Meat and Potatoes. Bread and Coffee.	Beef Stew and Vegetables. Bread and Butter.	Boiled Rice with Milk or Syrup.
Tuesday.....	Hashed Meat and Potatoes. Bread and Coffee.	Pork and Beans. Vegetables. Bread and Butter.	Indian Pudding and Milk or Syrup.
Wednesday.....	Boiled Potatoes. Stewed Meat. Bread and Coffee.	Stewed Codfish. Vegetables. Bread and Butter.	Bread and Milk, or Oatmeal Pudding and Milk.
Thursday.....	Fried Potatoes. Stewed Meat. Bread and Coffee.	Beef Stew and Vegetables. Bread and Butter.	Boiled Rice and Syrup, or Bread and Milk.
Friday.....	Boiled Potatoes and Meat Bread and Coffee.	Stewed Codfish. Potatoes. Pickles. Bread and Butter.	Indian Pudding and Milk, or Bread and Milk.
Saturday.....	Meat Stew. Boiled Potatoes. Bread and Coffee.	Corned Beef and Potatoes. Bread and Butter.	Bread and Milk, or Tea.

The building is lighted by gas, a Springfield Gas Machine being used. Burners are distributed through the halls, in the

dining-rooms, and hospitals. The transom openings over all the doors leading to the rooms on either side of the halls afford sufficient light for the inmates to undress, etc. The working of the Machine has been satisfactory, and the danger from fire much less than it would be if candles or kerosene oil were used about the wards.

The general health of the inmates has been as good as could reasonably be expected for such aged people as usually gravitate to such an institution, and no epidemics have prevailed among them since the new buildings were erected.

The Herkimer County Jail is located upon Main Street, in the village of Herkimer. The building is of stone, and was built in the remote past. That it has served its purpose these many years no one can gainsay ; but that it was ever a model institution, either from an architectural or sanitary point of view, no one will now affirm.

The building is situated upon a dry, gravelly ridge, and no arrangement for drainage exists. The village has no system of sewerage, and may in the near future suffer from a saturation of the soil from pollutions of all kinds. All refuse water used in and about the jail, all slops, the emptyings from the tubs in the prisoners' cells, are thrown into a sink located in the backyard, and conducted through a short drain to the vault of the privy (which is said to be tight), where it is absorbed by lime thrown into the vault in sufficient quantity to take up all the moisture. What the sanitary condition is of them I need not tell you. From its present condition, I should think the stench from them in warm weather would be unbearable.

A part of the building is set apart for the use of the jailor and his family. That portion of it devoted to jail purposes proper is constructed in a manner similar to all buildings devoted to like purposes. Within a large room is built two tiers of cells, one above the other, with a narrow corridor, only four feet in width, between the cell walls and the outside walls of the building. The upper tier of cells are reached by a short flight of stairs, and surrounding them is a narrow walk, from which the pedestrian is protected from falling to the lower floor by a railing made with gas-pipe.

The source of water-supply is from a well upon the prem-

ises, which is nearly two hundred feet from the privy vault. The water has never been scientifically examined, but is apparently wholesome. A cistern, from which water is used for laundry purposes, etc., is supplied from the roof of the building. There are no provisions for bathing purposes.

The building, or so much of it as is used for prison purposes, is heated by an old style of furnace located in the centre of the collection of cells occupied by the male prisoners. Its working is very inefficient, and some of the cells are said to be very cold in winter. The cells occupied by females are heated by a small stove in each of them.

At ventilation there is no attempt whatever, and vile odors pervade the whole of that part of the building occupied by men.

The size of the room in which is located the two tiers of cells occupied by male prisoners is $40 \times 35\frac{1}{2} \times 15$ feet high. The average number of occupants during the past year has been about twenty-five, and estimating that the cells occupy nearly one half the space in the room, the average air space to each prisoner would be four hundred to five hundred cubic feet. The cells are of two sizes, the smaller only large enough for one man, and containing one hundred and eighty-two cubic feet of air space, and the larger, occupied by three or four persons, containing seven hundred and eighty cubic feet. All cells communicate with the room proper by means of slatted iron doors.

The cooking is done in a large kitchen, and the food sent to the prisoners in mess-pans.

Taking the institution all in all, its hygienic surroundings have nothing in them to recommend and very much that is bad, if not positively detrimental to the inmates, as well as to the inhabitants of the village living in its immediate vicinity.

All of which is respectfully submitted.

C. W. HAMLIN, M.D.,

Chairman Committee on Hygiene, Herkimer County Medical Society.

COMMITTEE: C. W. Hamlin, M.D.; John P. Sharer, M.D.; W. H. H. Parkhurst, M.D.; A. Walter Suiter, M.D.; Henry A. France.

MIDDLEVILLE, N. Y., December 1, 1885.

PROGRESS OF PUBLIC SANITATION IN THE CITY OF NEW YORK: DRAINAGE OF THE CROTON AREA AND PURIFICATION OF THE WATER-SUPPLY; DEFICIENCY IN THE STREET CLEANING AND GARBAGE REMOVAL; THE MANURE NUISANCE.

Dr. John C. Peters, Secretary, presented the report of the Committee on Hygiene of the Medical Society of the County of New York, at the annual meeting, October, 1886, which was accepted, and took the usual course (referred to the Committee on Hygiene of the Medical Society of the State of New York).

Mr. President and Members of the Medical Society of the County of New York:

Your Committee on Hygiene was kept very busy, and, in fact, was greatly overtaxed in the beginning of the year by the consideration of several important topics, the principal of which was an examination into the present and future water-supply of New York. Your committee held many meetings, some of which extended into late hours of the night. It also attended meetings of the Aqueduct Commissioners, and others held by citizens, and while in frequent consultation with the engineers, they read over many abstruse and perplexing documents and calculations, and endeavored in every possible way to come to conclusions which would be for the present an ultimate benefit to the city, and do honor to this Society.*

We believe that it is entirely owing to the exertions of your committee, sustained by the Health Department, that a complete system of drainage of the whole Croton area, and the removal of all the nuisances which pollute the Croton water-supplies, was decided upon by the proper authorities.

Your committee was very firm in its stand that it would indorse none of the plans for an increased water-supply for this city unless pure water was guaranteed us.

However imperative it might be to have more water, we insisted that the new supply should be as pure as money and skill could make it, and that the purity of the old supply should be improved.

* See SANITARIAN, vol. 16, p. 289.

In this we think we have succeeded, and know we have succeeded, unless no faith whatever is to be placed on the positive, verbal, and written promises of those who are in authority over us.

The general plan of the new aqueduct was approved, and that of the new gate-houses. The urgent necessity for a small dam at Brewster, to have an immediate increased supply of water as soon as the new aqueduct is finished, did not detain us long, but we gave minute and careful attention to the plans for the great Quaker Bridge Dam and the formation of the huge Croton Lake, which alone can assure us that all the waters of the Croton area will be saved and ponded for times of drought. We finally decided unanimously that these great works were absolutely necessary, whatever might be the cost. We know that these works will be done skilfully, if they remain in the hands of the present engineers ; and we believe that they will also be done as economically as their huge proportions will permit of, provided depraved political influences do not override the skilled and honorable men who now have them in charge. And there seems to be less danger of that than ever before.

In some of these things, of course, your committee may be mistaken ; we believe, however, that the work will be well done, but the cost can only be measured by the honesty or greed of the politicians who may control it several years hence. We now receive only about one hundred millions of gallons of water a day, and you all know how scant that quantity is for our present wants ; in a few years we shall have double that quantity, and if the Quaker Bridge Dam be built, we shall have four hundred millions of gallons per day, and every day in the year, and that will be none too much. We also believe that the large supply will be purer than that which we now receive.

The case of the Drs. Purdy received our close attention and entire sympathy. We have already reported about it to the Society and the *Comitia Minora*, in whose hands it rests.

Various complaints have come to us about the decreasing efficiency of the street-cleaning service, and we would suggest that the officers of the Society recommend that all the members of the Society send in their opinions, in writing, on this important subject to the *Comitia Minora* or to the Committee

on Hygiene. In several of the cities of Europe ashes and garbage are collected separately, the latter being destroyed by fire in huge furnaces without offence and at little expense, a large portion of the necessary fuel being obtained from the unconsumed carbonaceous material which always remains in the ashes. The ashes and garbage residue, and the clean earth from digging cellars for new houses, together with all clean building waste, is utilized and sold for filling material for low lands.

With us almost all is towed down to sea, to the great injury of our harbors and the notable defilement of our waters and the shores of our beautiful islands. The great expense and difficulty of towing all our city waste down to sea in stormy weather prevents our streets from being properly swept, as it is useless to sweep streets very clean and carefully unless the sweepings can be carried away. This we believe is the principal reason why our streets are not better swept, and why foul dust almost always and mud often abounds. The cost of a complete garbage furnace is about $300,000, and some small cities, like Glasgow and others, have two of them. They work well, and soon save their first cost. We recommend that the Society take this matter into consideration and again assume the lead in good public works, as it has so often done before. The great street-cleaning movement of 1881 originated in this Society, and we are in some manner pledged to see that the work not only does not fall off, but that it be improved in every possible and economical way. We are fully aware that the bad state of our street pavements in some measure prevents good street-sweeping, and also that the storekeepers on the great business avenues and the residents not only of the tenement-house districts, but others more comfortably placed, throw a great deal of house and shop litter on the streets. In England the police officers report all such cases, and the offender is fined peremptorily. Every dirty street is also reported, and the delinquent street-sweepers are fined, the testimony of one or more householders being all that is required.

Your committee has paid some attention to the condition of stables in this city, and the careless and offensive way of storing and removing horse manure ; but the death of one of our most efficient members, Dr. Hardy, and the prolonged

illness of our chairman, and the ill-health of Dr. Hadden have prevented us from carrying our labors and intentions to full fruition.

Respectfully submitted,

E. H. JANES, M.D., Chairman.
JOHN C. PETERS, Secretary.
CYRUS EDSON, M.D.

November 11th, 1886. The minutes of the annual meeting, as a whole, having been adopted, Dr. John C. Peters, from the Committee on Hygiene, read the following supplementary report :

To the Medical Society of the County of New York :

Your Committee on Hygiene respectfully suggest that a petition be presented from this Society to the proper authorities, calling for the better and more healthful care, handling, carting, and shipping of stable manure than now prevails in public and private stables and manure yards in this city.

To the accomplishment of these desirable ends, your committee recommend that baling of stable manure be favored and enforced in all practicable and reasonable ways.

The advantages of baling manure are :

1. That it can be done on the inside of stables, thus doing away with the filling or emptying of sidewalk manure vaults.

2. There is great saving in labor and time in handling it, and considerable reduction of expense in carting and shipping it.

3. It can be carted, shipped, and moved with much less annoyance to our citizens here and to residents along the line of the railways which carry it away.

4. A constant demand will be created for it by dealers in fertilizers all over the country, who will cause it to be taken away promptly, thus doing away with the necessity for manure yards.

5. But the greatest advantage of all will be that the offensive and unhealthy sidewalk manure pits will be rendered entirely useless and superfluous ; so much so that your committee advise that petitions be sent from this Society to the Health Board and other authorities recommending the passage of an ordinance abolishing them entirely within a reasonable time—say, within one or two years.

Sidewalk manure pits are always very offensive and often injurious to the health of sick and delicate persons who live in their neighborhood. The malodors from them oppress the lungs, disgust the stomach, and depress the general strength or vitality of those convalescing from acute diseases, and exert a most injurious effect upon those struggling with debilitating chronic diseases. This is especially the case when the excretions of sick horses are thrown into and out of them, which happens every day.

They also greatly depreciate the value of property near by them ; and as they are allowed to exist in all parts of the city, the injury in the aggregate is very great.

These pits are filled and emptied in the most slovenly and disagreeable way, and are a standing reproach to modern civilization and health requirements. Even the dirtiest and most stench-hardened farmers always place their stables or barnyard several hundred feet away from their houses, while we are forced to endure them close to our residences, and that while there is a cheap and easy remedy within our reach.

The presses which are required to bale manure are like the ordinary hay presses, and cost only about twenty-five or thirty dollars, more or less. They occupy very little space, and do not require skilled labor to handle them.

Your committee would also call the attention of the Committees on Hygiene of the State or County Medical Societies, tending to the discovery of a cheap and reliable disinfectant for all stable smells. We are informed that common land plaster, or so-called crude plaster of Paris, or gypsum, sulphate of lime, will do this, and also improve the quality of the fertilizer. This is said to absorb and destroy all the foul smells from the decomposition of all the solid or liquid droppings of stables, and is well known to be one of the best fertilizers as well as disinfectants.

If this be so, then its use, combined with far better washing and sweeping than now obtains in most stables, will render them nearly inoffensive, and almost wholesome, or at least not very disagreeable or injurious.

E. H. Janes, M.D., Chairman.
J. C. Peters, M.D., Secretary.
Alexander Hadden, M.D.
Cyrus Edson, M.D.

HOSPITALS FOR CONTAGIOUS DISEASES IN BROOKLYN.

Proposed *Act* to authorize the Department of Health of the City of Brooklyn, County of Kings, to establish hospitals for contagious and infectious diseases and in relation to the erection, government, and maintenance thereof.

SECTION 1. The Mayor, with the Commissioner of the Department of Health and the Commissioner of the Department of City Works of the City of Brooklyn, are hereby constituted a Commission with power and authority by this Act to select a site in or near the City of Brooklyn, County of Kings, for the erection of public hospitals for the reception and treatment of persons suffering from infectious or contagious diseases.

SEC. 2. After such a site has been selected as aforesaid, it shall be purchased at a fair market value or leased by said Commissioners.

SEC. 3. The Board of Estimate of the City of Brooklyn is hereby authorized to include from year to year in its annual report the sum or sums necessary for the purchase or lease of said site, and for the erection and maintenance of said hospitals, and the sum or sums so reported shall be included in the annual tax levies of said city.

SEC. 4. After such site has been selected as aforesaid, either by purchase or lease, and whenever funds have been provided in the manner aforesaid, the said Commissioners are empowered by this Act to take such property by purchase or lease in the name of the City of Brooklyn, after the Corporation Counsel shall have approved the validity of the title to the same.

SEC. 5. The management of said hospitals shall be under the direction and control of the Commissioner of the Department of Health of the City of Brooklyn.

SEC. 6. The said Commissioner of the Department of Health of the City of Brooklyn shall make rules and regulations for the conduct and government of said hospitals.

He shall appoint all physicians, who shall be Doctors of Medicine, holding degrees from medical colleges in good standing. He shall appoint such employés, nurses, and servants as may be necessary, and determine their salaries, and shall regulate the scale of prices for those who are able to pay for admission and treatment.

But no person having an infectious or contagious disease shall be refused admission to these hospitals because of his or her inability to pay.

SEC. 7. The Commissioner of the Department of Health is hereby authorized to cause to be removed to these hospitals any person or persons afflicted with contagious or infectious diseases whose house and sanitary surroundings are not satisfactory to the said Commissioner.

SEC. 8. All moneys received from patients treated in these hospitals shall be paid into the City Treasury.

SEC. 9. This Act shall take effect immediately, and all Acts or parts of Acts conflicting with the same are hereby repealed.

[This bill has been introduced in the Legislature with a good prospect of becoming a law.—A. N. B.]

THE DEEPEST ARTESIAN WELL.—A correspondent encloses a newspaper "cutting" which states that the deepest artesian well in the world is that now being bored at Pesth, for the purpose of supplying the public baths and other establishments with hot water. A depth of 951 metres (3120 feet) has already been reached, and the flow secured aggregates 850 cubic metres (176,000 gallons) each twenty-four hours, the temperature of the water being 70° Centigrade (158° Fah.). The municipality which is conducting the work as a public measure is not satisfied with the above showing, and has lately voted a large appropriation in order that the boring may be continued to a greater depth, not only to obtain a larger volume of water, but also to secure a gain in temperature of same. It is thought the flow from the lower levels will show a temperature of 80° Centigrade (176° Fah.).

HEALTH OF U. S. ARMY FOR SEPTEMBER, 1886.

DURING the month of September, in eight military departments, embracing 142 military posts and arsenals and 27 commands operating in the field from which reports were received, there was returned a total mean strength of 22,742 officers and enlisted men.

There were admitted to sick report 2358 cases of disease and injury, or 112 per 1000 of mean strength.*

This is a decrease of 10 per 1000 below that for September, 1885, and 30 per 1000 below the average monthly rate for the ten years (ending December 31st, 1884), which was 142 per 1000 of mean strength.

Twenty-seven deaths occurred, as against 22 for the previous month and 17 for the previous September. This represents an annual mortality from all causes of 14.2 per 1000, or 1.5 per 1000 greater than the average for the preceding decade, which was 12.7 per 1000 of strength.

The number of discharges for disability was 59, † representing an annual loss to the army from this cause of 14 per 1000 of strength.

The number of troops constantly non-effective from sickness was 915, or 40 per 1000 of strength; being 1 per 1000 less than for last month. The rate for the previous September was 42 per 1000, and for the previous decade 44 per 1000 of strength.

The rate of recoveries to the whole number under treatment was 696 per 1000; the rate of deaths, 8.2 per 1000.

The average duration of treatment among patients who recovered was 11 days, and among those who died, 31 days.

The causes of deaths were returned as follows: Enteric-fever, 3; dysentery, 3; enteritis, 2; pneumonia, 1; bronchitis, 1; remittent-fever, 1; nervous exhaustion, consequent upon an attack of quotidian intermittent-fever, 1; diarrhœa, 1; valvular disease of heart, 1; cardiac syncope (not on sick report and no autopsy), 1; tumor of cerebellum, 1; shock, consequent upon amputation for aneurism of popliteal artery, 1; shot wounds, 3 (2 of which were suicidal and one homicidal); concussion of brain, 2; concussion of brain with other wounds (homicidal), 1; drowning, 2; morphine-poisoning (suicidal), 1; and crushing (by fall of flag-staff), 1.

The causes of admission and those which have chiefly served to impair the health of the army during the month of September are shown in Table I.

* The names and diseases of all officers and enlisted men who are excused from any part of their military duty by reason of disability are required to be entered upon the reports from which these data are drawn.

† Recruits at depots, discharged for disability which existed prior to enlistment, not included.

TABLE I.

Causes of admission in the order of their numerical importance.	Number of cases.	Rate per 1,000 for September, 1886.	Average rate per 1,000 for ten previous Septembers.	Increase or decrease of rate.
First.				
Diarrhœal diseases	397	17.46	27.72	−10.26
Diarrhœa	342	15.04	24.18	− 9.14
Dysentery	32	1.41	2.59	− 1.18
Cholera-morbus	23	1.01	.95	+ .06
Second.				
Injuries and accidents	387	17.02	19.25	− 2.23
Contusions and Sprains	219	9.63	12.12	− 2.49
Incised, punctured, lacerated and contused wounds	88	3.87	3.90	− .03
Fractures (not shot)	15	.66	.63	+ .03
Shot wounds	10	.44	.95	− .51
All other injuries	55	2.42	1.65	+ .77
Third.				
Malarial-fever and resulting conditions	340	14.95	31.42	−16.47
Fourth.				
Diseases of the digestive system.	291	12.80	?	?
Constipation, dyspepsia, and colic	140	6.16	9.01	− 2.85
Tonsillitis, pharyngitis, and sore throat	56	2.46	?	?
Other diseases of this class	95	4.18	?	?
Fifth.				
Venereal diseases	147	6.46	?	?
Gonorrhœa and results	56	2.46	3.79	− 1.33
Syphilis and results	55	2.42	3.82	− 1.40
Other venereal diseases	36	1.58	?	?
Sixth.				
Diseases of the respiratory system	142	6.24	11.53	− 5.29
Catarrh	73	3.21	7.23	− 4.02
Bronchitis	45	1.98	2.91	− .93
Pulmonary phthisis	3	.13	.29	− .16
Pleuritis	2	.09	.39	− .30
Pneumonia	3	.13	.18	− .05
Other diseases of this class	16	.70	.53	+ .17
Seventh.				
Rheumatism (incl. Muscular)	123	5.41	8.33	− 2.92
Eighth.				
Diseases of the nervous system	95	4.17	9.07	− 4.90
Headache and neuralgia	84	3.69	8.10	− 4.41
Other diseases of this class	11	.48	.97	− .49
Ninth.				
Typho-malarial-fever	18	.79	.53	+ .26
Tenth.				
Enteric-fever	5	.22	.79	− .57

Among the more important diseases under treatment during the month of September—those remaining sick from the previous month being included—were 33 cases of enteric-fever, 5 new cases being reported; 23 cases of typho-malarial fever, 18 of which were new admissions; 7 cases of pneumonia, 3 of which were admitted this month, and 11 cases of pulmonary phthisis, 4 of which were newly admitted.

This is a decrease of 1 case of enteric-fever; an increase of 18 cases of typho-malarial fever; a decrease of 1 case of pneumonia, and of 6 cases of pulmonary phthisis from the whole number under treatment in August.

The ratio of mortality from enteric-fever to cases treated was 9.1 per cent; typho-malaria fever, 0; pneumonia, 14.3, and from pulmonary phthisis, 0 per cent of cases treated.

A comparison of the health of the several military departments is given in Table II.

TABLE II.

	Admission rate per 1,000 of mean strength.	Number of troops per 1,000 of mean strength constantly non-effective from sickness.	Average number of days treated among patients who recovered.	Rate per 1,000 of deaths to number of cases treated.
Department of:				
Texas	127	64	12	5.5
Missouri	126	46	9	12.2
East	107	35	11	5.9
Dakota	106	40	10	7.1
Platte	101	40	11	10.7
Arizona	87	39	12	8.6
California	86	24	17	10.4
Columbia	67	27	15	6.5
The entire army for the month	104	40	11	8.2
The entire army for the preceding decade, monthly average	142	44	?	7.5

Twenty-six posts have shown admission rates for the month which were greater than the normal of 142 per 1000 of mean strength, and 116 less.

In the Department of the Missouri, 33 per cent of the posts gave admission rates above the normal. In the Department of Dakota, 30 per cent ; in the Department of the East, 17 per cent ; in those of Texas, the Platte, and of Arizona, each 15 per cent ; in that of California, 8 per cent ; and in that of the Columbia none of the posts gave admission rates that were greater than the normal.

The posts showing the highest rates per 1000 of mean strength were : Jefferson Barracks, Mo., 242 ; Washington Barracks, D. C., 240 ; Fort Davis, Tex., 231 ; Indianapolis Arsenal, Ind., 231 ; Fort Gibson, I. T., 228 ; Fort Wingate, N. M., 217 ; Fort McKinney, Wyo. T., 204 ; and Fort Bliss, Tex., 200.

The lowest admission rates were : Allegheny Arsenal, Pa., 0 ; Fort Marcy, N. M., 0 ; Fort Mason, Cal., 0 ; Fort Cummings, N. M., 9 ; Fort Pembina, D. T., 13 ; San Diego Barracks, Cal., 22 ; Fort Ontario, N. Y., 23 ; and Alcatraz Island, Cal., 24 per 1000 of mean strength.

Forty-one posts have shown rates of constant non-effectiveness from sickness above the normal of 44 per 1000 of mean strength, and 98 below.

In the Department of Texas, 42 per cent of the posts furnished rates of constant non-effectiveness from sickness above the normal. In that of Arizona, 39 per cent ; of the Platte, 38 per cent ; of Dakota, 35 per cent ; of the Missouri, 27 per cent ; of the East, 25 per cent ; of California, 15 per cent ; and of the Columbia, 12 per cent.

The posts showing the highest constant rates were : Fort Davis, Tex., 151 ; Jefferson Barracks, Mo., 116 ; Fort Brown, Tex., 89 ; Fort Assiniboine, M. T., 80 ; Fort Sill, I. T., 76 ; Fort Robinson, Neb., 74 ; Fort Wingate, N. M., 72 ; and Fort Lewis, Col., 70 per 1000 of mean strength ; while the lowest rates were : Allegheny Arsenal, Pa., 0 ; Fort Mason, Cal., 0 ; Fort McDermit, Nev., 1 ; Fort Fred Steele, Wyo. T., 2 ; Fort Klamath, Ore., 4 ; Fort Pembina, D. T., 5 ; Watervliet Arsenal, N. Y.. 6 ; and Fort Mackinac, Mich., 6 per 1000 of mean strength.

At stations reporting high admission rates malarial fevers, diarrhœal diseases, and those of the digestive system, together with injuries, have prevailed.

The causes producing high constant rates were: Malarial-fever, diarrhœa, enteric-fever, typho-malarial fever, pneumonia, and rheumatic-fever. While the more serious of the diseases here mentioned did not occupy a position as the most prevalent, their nature was such as to require longer treatment, thereby increasing the constant sick-rate at the several posts where they occurred.

Enteric-fever during the month of September existed at fourteen stations, as follows: At Fort Davis, Tex., 6 cases; West Point, N. Y., and Fort Assiniboine, M. T., each 4 cases; Fort Huachuca, A. T., and Fort Riley, Kan., each 3 cases; Fort Monroe, Va., Fort Sill, I. T., Fort Bayard, N. M., and Fort Randall, D. T., each 2 cases; and at the following: San Antonio, Tex., Fort Reno, I. T., Fort Lowell, A. T., Fort Douglas, U. T., and Jefferson Barracks, Mo., each 1 case. Of the above cases, those treated during the month at Fort Assiniboine, Fort Riley, Fort Sill, Fort Bayard, and Jefferson Barracks, each included 1 new admission.

Three deaths occurred from this disease: 1 at Fort Huachuca, A. T., 1 at Fort Randall, D. T., and the other was that of a private attached to the Signal Corps at Cincinnati, O., the case having received no treatment from any member of the medical corps of the army.

Typho-malarial fever was reported at four stations, as follows: At Fort Lewis, Col., 14 cases; Fort Thomas, A. T., 4 cases; Fort Meade, D. T., 3 cases, and at Fort Mojave, A. T., 2 cases. Those newly admitted were reported at Fort Lewis, 12 cases; Fort Thomas, 2 cases, and Fort Mojave, 2 cases.

The cases referred to at Fort Lewis all orginated in a field command, located on the La Plata and San Juan rivers.

Pneumonia existed at six stations, as against seven for August and ten for July. The cases newly admitted occurred at Fort Davis, Tex., Fort Grant, A. T., and Newport Barracks, Ky., each 1 case. The only death from this disease reported was at Newport Barracks, Ky.

Erysipelas was reported at Fort Leavenworth, Kan., and Fort Gaston, Cal., each 1 case.

Mumps, 2 cases, at Willet's Point, N. Y.

The officer in medical charge of a field command encamped on the La Plata River, near Farmington, N. M., furnishes the following: "At the close of the last month (August) two cases of mountain-fever remained under treatment, and prior to the 13th inst. 10 new cases appeared, all of Company 'H,' Twenty-second Infantry. These cases, as they originally bore no symptoms of a typhoid character, were regarded as remittent-fever with adynamic tendencies, as described by Surgeon Smart, of the army, and diagnosed as such prior to their transfer to Fort Lewis, Col. Their subsequent history while under treatment at that post developed unmistakable typhoid symptoms, consequently their diagnosis was changed to typho-malarial fever, as described by Surgeon Woodward, of the army. Upon the departure of Company 'H,' on the 13th inst., the rainy season practically ceased, the La Plata receded to its original limits and lost its obnoxious odor, and no new cases of mountain-fever appeared. It is remarkable that the only cases of well-marked typho-malarial fever occurring among troops serving on the La Plata River during the present summer appeared during the rainy season, and in Company 'H,' Twenty-second Infantry. No sickness of this character has occurred among the officers, or in the detachment of cavalry, or among the civilians serving with the command; while of the enlisted men of Company 'H,' about 33 per cent of their number were affected with disease, a fact which shows that the members of 'H' Company's mess and the daily visitants of their sinks alone have contracted the disease."

It seldom rains in the valley of the La Plata River except during the rainy season, consequently a large amount of organic matter collects upon its water-sheds, and is at this time washed into the stream.

Several herds of cattle were in early spring mired in this river, and no doubt to these circumstances may be attributed the horrid stench of the stream.

A few cases of typho-malarial fever, of a mild type, appeared among the settlers of the La Plata and Animas rivers during the present summer.

The following note of the transfer of the Chiricahua Indian prisoners of war from Fort Apache, A. T., to St. Augustine,

Fla., is furnished by the surgeon who was in medical charge of the party : " The general health of the troops and prisoners during the entire trip was excellent. Of the troops it may be said there was no sickness, there being only a few cases of constipation and diarrhœa ; but these yielded at once to treatment, and were not such as necessitated taking the soldier off duty. Of the twenty-five Indian scouts, none were sick. Of the Indian prisoners, several suffered with intermittent-fever, men, women, and children. This, in my opinion, was contracted at Camp Apache from an unhealthy encampment. They were living on the banks of a stream which the summer rains transformed into marshes filled with rank vegetation, thus giving rise to the malarial poisoning. By the use of quinine they had very much recovered before reaching St. Augustine. Many of them were troubled with diarrhœa while *en route*. This was, doubtless, owing wholly to dietetic causes. Some of them brought fresh beef on the train, and having no way to cook it, ate it dried ; others were not accustomed to hard bread and canned beef issued on the cars ; while others ate freely of watermelons, for which they bartered trinkets while *en route*, all of which causes were instrumental in producing irritation of the bowels. However, they all arrived much improved, except one woman, who was very old, and appeared, though not suffering with any disease, exhausted by the trip.

" It was noticeable that when the command arrived in Kansas many of the Indians, chiefly men and children, were attacked with epistaxis. It seems very singular, in view of the fact that they are people who live in the mountains at a high altitude, and were going to a lower one, while the same trouble affects those coming from the East to the rarefied air of higher altitudes.

" Several of the officers were attacked with ' colds,' but not until they reached the warm, moist, and to them oppressive air of the South, almost at the sea-level."

The post surgeon at Fort Thomas, A. T., forwards a special report in reference to remittent and typho-malarial fevers occurring at that post in the latter part of September and in October, the substance of which is as follows : " During the latter part of September and in October a number of very severe cases of remittent and typho-malarial fever came under

my treatment. These cases all occurred among the white troops of companies 'B' and 'D,' Ninth Infantry, who were transferred from Wyoming Territory during the latter part of July.

"The men of Company 'B,' who had been quartered in comfortable adobe barracks ever since their arrival at Fort Thomas, and had *no field service*, furnished six cases of typhoid-malaria fever; those of Company 'D,' who had been in the field, occupying a summer camp in an elevated region during the heated term in September, furnished but two cases, one a soldier, who having had acute diarrhœa in August, was returned to duty, participated in a scout with his company, and was subsequently admitted for typho-malarial fever; the other, a case of remittent fever, which assumed the typho-malarial type.

"Of the cases occurring in Company 'B,' three were admitted as having remittent-fever, but after admission they showed very decided adynamic and ataxic symptoms, with delirium, carphologia, and involuntary discharges from the bowels. Peritonitis, with retention of urine, occurred in one. In another pharyngitis and passive hemorrhages from nose and fauces, with great deafness and albuminous urine, were observed.

"There was considerable mental hebetude in all the cases diagnosed as typho-malarial and in several of the remittent cases. Slight diarrhœa occurred in only three. In one case only was there any eruption, which consisted in very small red patches over the chest and abdomen, and occurred during the second week; they were irregular in contour, and did not resemble the rose-colored eruption of enteric-fever. These occurred, also, in this case, and at the same time a papular eruption, confined to the forehead. Iliac tenderness was absent in all the cases, except (of course) in that complicated with peritonitis; this one commenced with great pain and tenderness in the right iliac region, which extended over the entire abdomen, with high temperature, tympanitis, and retention of urine. In most of the cases there was more or less vomiting, some of them not retaining even milk and lime-water."

He further states: "From all the symptoms thus generally referred to, and from my constant careful personal observa-

tions in this group of interesting cases, I find it very difficult to determine whether or not we have ulceration of Peyer's patches or distinct enteric-typhoid complications. Only this afternoon the patient whose case was referred to above as complicated with peritonitis had a bloody passage, but no iliac tenderness. It seems a noteworthy fact that of all the malarial cases that occurred this month only one assumed the intermittent type. There is nothing unusual to report in the matter of treatment of these cases. In a general way, free ventilation and disinfection, scrupulous cleanliness, and the selection of suitable diet are carefully attended to. As to medicine, quinine is chiefly relied on, and given two to three times daily, in doses varying, according to conditions observed, from six to twenty grains. Special symptoms are treated on general principles as they arise ; much benefit has been derived from cold and tepid sponging of the body. The facts herewith reported in connection with this group of interesting cases strongly suggest certain sanitary precautions which should be kept in view in future, and the observance of which can well be recommended and urged by the Medical Department as far as it may be possible to comply therewith. *First.* The fact that all these cases occurred among the unacclimated shows the great danger to the health of the troops that attaches to a change or transfer from a cold to a hot and malarious climate in midsummer. While it might be said that the balance of the garrison at this post (consisting of colored troops) should be naturally less affected by a malarious climate than white troops, it is also a fact that the white citizens residing at or near this post, and who are duly acclimated, are as free from typho-malarial cases as the colored soldiers. *Second.* The marked immunity obtained by the men of 'D' Company, Ninth Infantry, as compared with those of 'B' Company of the same regiment, and the different conditions to which these two companies were subjected, form a most excellent and rational basis upon which to strongly recommend that garrisons at posts like this be sent to some elevated summer camp during the heated term, such as was occupied by 'D' Company, Ninth Infantry, during last September. It is a question whether had 'D' Company remained continuously at post, and under canvas,

they would not have been as seriously afflicted (or even more so) as is 'B' Company, which did remain continuously in barracks; for, as may be seen by referring to the Com. Rept. from this post of last August, the preponderance of malarial diseases there was with 'D' Company, as it is now with 'B' Company—the inference is plain enough, that the health of 'D' Company was improved by their march and summer camp, short though the period of their sojourn away from this post was.

"At the date of this report the prognosis is very unfavorable in three of the cases remaining under treatment."

Reports received from 27 commands operating in the field showed an aggregate mean strength of 1128 officers and enlisted men.*

Sixty-three cases, or 56 per 1000 of mean strength, were admitted to sick report during the month, of which number eleven were transferred to permanent stations for treatment, and appear upon their returns.†

Of these admissions, 54, or 86 per cent, were for diseases, and 9, or 14 per cent, for injuries.

Sixteen commands were operating or *en route* in the Department of Arizona, their aggregate strength averaging, for the entire month, 675 officers and enlisted men, with 33 cases of disease and injury, or 49 per 1000; in the Department of the Platte *four*, representing a total mean strength of 180, with 16 cases of disease and injury, or 89 per 1000; in the Department of the Missouri *three*, with an aggregate mean strength of 113 and 8 admissions to sick report, or 71 per 1000; in that of Dakata *two*, embracing 59 officers and enlisted men, with 6 admissions to sick report, or 102 per 1000; in the Department of the Columbia *two*, aggregating 96 officers and men, with none sick.

The prevalent disorders among troops in the field were malarial-fevers and diseases of the digestive and integumentary systems.

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* There were other commands in the field to which no medical officers were attached, and from which this office received no reports.

† To avoid duplication, these cases are dropped in the final consolidation for the entire army.

Attached to the army, and living at the different military stations, were 5219 women and 6224 children, the wives, children, and servants of the officers and enlisted men.

Among the women were reported 454 cases of sickness during the month, or 87 per 1000 living. Six deaths occurred, representing an annual death-rate of 13.8 per 1000 living. The causes of death were reported as follows: enteric-fever, 1; rheumatism, 1; heart disease, 1; puerperal peritonitis, 1; old age, 1, and 1 reported as unknown.

Among the children 341 cases, or 55 per 1000, were taken sick. Eleven deaths occurred (7 of which were of those under five years of age), representing an annual death-rate, at all ages, of 21.2 per 1000.

The causes of deaths were reported as follows: diphtheria, 2; cholera infantum, 2; immaturity (premature birth), 2; convulsions, 1; inanition, 1, and unknown, 3.

The only contagious diseases reported are referred to in the following special notes.

The post surgeon at Fort Grant, A. T., stated in reference to a case of scarlet-fever occurring in a child at that post, that he had not been able to discover the origin of the disease, but suspected that it had been introduced from some station on the Southern Pacific Railroad by some of the troops that had returned from the field or that passed through *en route* to their stations.

The post surgeon at Watervliet Arsenal, N. Y., states: "There have been two malignant and fatal cases of diphtheria among the children at this post, both of one family, the disease having undoubtedly been contracted outside of the post while at school. The cases were at once isolated, and every precaution taken to prevent its spread. The funerals were strictly private, and after the disposal of the bodies the house was thoroughly disinfected with crude sulphur and properly aired. No new case has thus far occurred."

Malarial-fever and diarrhœal diseases have been the most prevalent disorders reported among this class, while diseases of the digestive system and respiratory catarrhs may be mentioned as relatively next in order of prevalence.

EDITOR'S TABLE.

CLIMATE AND CONSUMPTION.

THE following is a copy of an open letter sent by Dr. Charles Denison, of Denver, to Dr. A. N. Bell, editor of THE SANITARIAN, relative to the death-rate from consumption in Colorado :

DENVER, January 10, 1887.

Dr. A. N. Bell, Editor of the Sanitarian.

DEAR SIR : I send you a copy of our State transactions, containing the last two years' proceedings of the Colorado State Medical Society. The article by Dr. E. A. Lee on "Is Consumption Indigenous to Colorado?" I have marked, thinking you would be interested in giving the readers of THE SANITARIAN a *résumé* of it. This inquiry of Colorado physicians was made, you see, before your criticisms of my paper, read at the 1885 meeting of the American Climatological Association (see the New York *Medical Journal* for December 5th, 1885), and therefore was not specially carried out to refute your argument implied in the statement that "in Colorado, Florida, Mississippi, the ratio of deaths from consumption was eight per cent." You will notice that the experience of physicians throughout Colorado for two years or more, as set forth in Dr. Lee's report, shows that very few cases of phthisis had originated in Colorado, and tallies very closely with the following statement just made for the year 1886 by Dr. McLaughlin, Denver's Health Commissioner. New blanks for certificates of death were issued a year ago, requiring all physicians reporting deaths from consumption to state whether such cases originated in Colorado or elsewhere.

Statement of consumption contracted in Colorado, taken from records of Board of Health of Denver, Col., for the year 1886 :

	Case contracted elsewhere.	Case contracted in Colorado.	Total cases.
January	22	0	22
February	12	0	12
March	15	2	17
April	22	0	22
May	14	0	14
June	14	0	14
July	14	1	15
August	13	0	13
September	17	0	17
October	17	2	19
November	13	0	13
December	17	0	17
Total	190	5	195

The whole number of deaths is 841.

Very respectfully,

H. W. McLAUGHLIN.

W. GOVE, Clerk.

Now, it will be admitted by all who know the facts in Colorado, that the country is much healthier as regards tubercular disease than the metropolis of the State—*i.e.*, that the origination of tubercular disease should be still more infrequent outside than within the city of Denver. Well, then, if we take the record furnished by Denver's health commissioner, the proportion of deaths from phthisis in Denver is twenty-three per cent of all deaths ; but the exact mortality from consumption which should be credited as indigenous to this city is three fifths of one per cent, or five cases. This record is small enough for a *hospital* city, especially when compared with over twenty per cent mortality from consumption which many cities furnish, and the fourteen per cent which the whole country averages.

In trying to cure the unfortunates we are willing to "carry" part of the unfortunate mortality rightfully belonging to the lowlands, but we insist that our generosity must be appreciated !

It may be claimed that the record in Florida and Mississippi is also distorted by the immigration of invalids. This cannot be so much so as is the case in Colorado, I infer, because, for one reason, some of our invalids come from those States.

The argument, then, is a fair one that those climatic attributes are most likely to arrest the progress of consumption, which will furnish among residents so exceedingly small a mortality indigenous to a given locality.

Yours respectfully,

CHARLES DENISON.

—*From Denver Republican, January 12th, 1887.*

The foregoing letter bears evidence of an awaited opportunity to reply to some remarks made by Dr. Bell in the discussion of certain resolutions by Dr. Denison proposed to the meeting of the American Climatological Association in New York, May 28th, 1885, declaring that atmospheric dryness and elevation are essential elements in the climatic treatment of consumption.

Dr. Bell's remarks referred to by Dr. Denison are reported as follows:

"The maps which Dr. Denison had prepared to show the relative moisture and dryness in different parts of the United States, with a view to enabling physicians to decide where to send their phthisical patients, went far to counteract the position which Dr. Denison started out with, that dryness was the essential element in the cure of phthisis. Studying these maps, and the reports on which they were based, we found some curious facts. In Colorado, for example, the ratio of mortality from consumption to the mortality from all causes varied only a small fraction of one per cent from that of Florida, Mississippi, and Louisiana, exclusive of New Orleans, where there were just reasons why the mortality from phthisis should be excessive. It was considerably higher than in Texas, which also had a damp climate. What the president (Dr. Loomis) had said with regard to the Adirondack region had an equal bearing on the subject. Everybody knew that forests were the storehouses of moisture, and, so far as we could go in measuring these climates, they were exceedingly damp, and for manifest reasons—not only because of the large amount of rainfall, but also because the leaves interfered with evaporation. It had also been shown that there was something besides heat, as well as besides relative dryness, which had an important influence on the consumptive. We might refer to the statistics of the navy. It would be said that the

men in the navy were picked men, but that fact might be offset with the further fact that they were of the age when phthisis was most likely to develop, seafaring men usually occupying bad quarters for sleeping. The ratio of deaths from phthisis in the navy to deaths from all other causes was 6.3 per cent, while in Colorado, Florida, and Mississippi the ratio was 8+ per cent. In Texas, Arkansas, and Arizona it was about 6 per cent, or nearly the same as on the ocean. According to English statistics, the mortality from phthisis was ten times less on the ocean than on land ; if allowance was made for the seaman's age, from fifteen to forty-five years, it was sixteen times less. The rate of mortality from consumption among all classes who lived on the water in this country, including canal and river men, and their wives and children, was less in comparison with the general mortality than that of several of the New England States. Consumptives on land, subjected to like conditions, would certainly die much faster. More than thirty years ago he had kept records of the mortality occurring on vessels on the west coast of Africa, and found that the number of deaths from phthisis was greater at a given locality where the atmosphere was dry than at points where there was greater moisture, which went to show that moisture alone was not the cause of greater mortality among the phthisical. An atmosphere containing clean moisture was by no means necessarily promotive of consumption. If one wished to experience the full benefit of the Adirondack region he should go into it, and not remain on its outskirts. There one would get the benefit of free drainage, atmospheric agitation, electrical change, and a bountiful supply of ozone, equal to that developed by the action of the waves on the seashore. He had examined the maps prepared by Dr. Denison very carefully, and, while he held in admiration the industry displayed by the author, he certainly was far from being willing to accept his suggestion to make excessive dryness, to say nothing about altitude, the test of climate for consumptives."

Subsequent study of the same subject with authentic data verify the remarks quoted, except that the ratio of deaths from consumption to deaths from all causes in the navy was overstated, the correct figures for ten years' average in the navy

being 5.87. And "it should be borne in mind that, according to the most reliable statistics, only about one fourth of all the cases of phthisis are found to be hereditary—three fourths of the cases are acquired by the manner of life; and the life of the seaman, especially that portion of it which he spends on shore, free from the constraints of ship discipline and the involuntary benefit of a sea atmosphere, is not such as to promote his exemption. And, unfortunately, many physicians, as well as other people, seem to have jumped to the conclusion that because it has been shown that a filthy, cold *soil*-moisture predisposes to consumption, safety is to be found only in an excessively, or at least relatively, dry atmosphere, beset by no matter what complications. But so far as statistics are attainable, evidence is wanting to substantiate such a conclusion." ("Climatology and Mineral Waters of the United States." By A. N. Bell, M.D. P. 91.)

To the suggestion of Dr. Denison that the mortality from consumption in Colorado is almost exclusively of recent visitors —who resort thither too late for benefit—it is an old argument. It is only a few years since Minnesota, according to some writers, possessed the high and dry climate to which all consumptives should resort. Now it is Colorado. Dr. Talbot Jones, of St. Paul, in particular, found there—before there were many people—such exemption that he decried all different places, and especially "the atmosphere of Florida, loaded with moisture," as wholly unsuited to consumptives under any circumstances, while he claimed for Minnesota exemption, fortified by the same kind of arguments as those used by Dr. Denison. But Dr. Charles J. Kenworthy, of Jacksonville, Fla., shortly after showed, by numerous replies to a circular note similar to that of Dr. Lee to which Dr. Denison refers (noticed under the head of Literary Notices on another page), that the deaths from consumption in Florida were almost exclusively of those who resort thither for relief; that many physicians of large practice in the State have never had a case that originated there, except in families of strongly marked hereditary tendencies acquired elsewhere. Moreover, to complete the similarity of evidence, Dr. Kenworthy adduces the mortuary report of Jacksonville, by the health officer, and an appended note, as follows:

"HEALTH DEPARTMENT, CITY OF JACKSONVILLE, April 10, 1880.

"*Dr. J. C. Kenworthy.*

"DEAR SIR: A careful examination of the mortuary reports in the city sexton's office reveals the following facts:

"Previous to 1878 the records were imperfectly kept, and are not reliable.

Mortality for 1878 119
Mortality for 1879 171

Mortality for two years 290
Deduct from this number visitors who died of phthisis, Bright's disease, and organic disease of the heart 40
Total mortality of residents 250
Percentage of mortality among residents for two years, per 1000 ..... 12.5
Percentage of deaths from phthisis among residents, per 1000 ..... 0.55
Percentage of deaths from pulmonary diseases, other than phthisis, per 1000 ..... 1.4

"A. W. KNIGHT, M.D., Health Officer."

To which Dr. Kenworthy appends the following, from the most recent statistics at that time (1879) available:

"*Florida:* Mortality per 1000 from all causes 9.2
Deaths per 1000 from consumption, including invalid visitors 0.60
Deaths per 1000 from consumption, excluding visitors who came to the State in the last and an incurable stage of this disease 0.44
Deaths per 1000 from pulmonary diseases, other than consumption 0.50
Deaths per 1000 among residents from pulmonary diseases, including consumption 0.94

There was one death from consumption, including visitors, to 15.2 from all causes.

There was one death from consumption among residents, to 18.2 from all causes.

There was one death from pulmonary diseases, to 8.2 from all causes."

("Climatology of Florida." By Charles J. Kenworthy, M.D., Jacksonville, Fla., President of Florida Medical Association, etc., 1880.)

These statistics are almost identical with those of the last census report.

Finally, it was not our purpose in the remarks to which Dr. Denison takes exception, nor is it our purpose now, to show that Colorado is not among the best resorts for persons afflicted with consumption under some phases of the disease, but to show the fallacy of the belief in altitude and atmospheric dryness as essential conditions in the treatment or prevention of the disease. *The* climate of all others which, in our opinion, is most inviting for the cure or prevention of consumption, is that which is most free from organic dust of every kind, and if also free from inorganic dust, so much the better. "And after all that has now been stated of the effects of the atmosphere in high altitudes or at the level of the sea, the influence of forests and ocean, of sea-coasts and interior places, humidity and dryness, cold and heat, the winds, electricity, and ozone, and no matter what of other conditions, the paramount considerations for the promotion of health are an *abundance of pure air and sunshine and out-door exercise.* Without these no climate is promotive of health or propitious for the cure of disease; and with them it is safe to say the human powers of accommodation are such that it is difficult to distinguish the peculiarities of any climate by their joint results on the health and longevity of its subjects." (Bell's "Climatology," etc., p. 376.)

MORTALITY AND MORBILITY STATISTICS AT MOST RECENT DATES.

ALABAMA.—*Mobile* reports 85 deaths during December in a population of 31,295 (census 1880). Death-rate per 1000, 32.5. From zymotic diseases there were 12 deaths, and from consumption 11. Deaths reported under five years of age numbered 18.

CALIFORNIA.—Reports received from 95 localities in various parts of the State for the month of December indicate an increased prevalence of pulmonary diseases, diphtheria, croup, and scarlet-fever. So far, none of them have become really epidemic, and by strict quarantine might still be confined to the places in which they are now endemic and there eradicated.

Diphtheria prevails quite extensively throughout the State. *Scarlet-fever* is reported in Sacramento, Susanville, Maxwell, St. Helena, Colton, Lodi, Truckee, Anderson, Cottonwood, Dixon, Placerville, Millville, Santa Rosa, Nevada City, Auburn, Eureka City, Los Angeles, Oakland, and San Francisco. In Auburn it was diffused by allowing a child to attend school with the eruption already developed ; in other towns a probably like causation might be obtained, and, until the public is educated to appreciate the value of an *efficient* health officer, such histories of the spread of death-dealing disease will be constant.

Typhoid-fever is much less prevalent than might be expected at this season of the year. It is, however, noticeable in Salinas, Galt, Maxwell, Igo, Lodi, Gridley, Amador City, Weaverville, Lakeport, Los Angeles, San Diego, Sierra City, and San Francisco. The type is apparently not severe, as the mortality is limited. *Whooping-cough* is still present in Saucilito, Merced, Amador, and Sacramento.

CONNECTICUT.—No reports of mortality have been received from the registrars of Norwich and South Norwalk. The total number of deaths in the eight other cities of Connecticut during December was 356, as against 348 in the same cities in November.

The annual death-rate in these eight cities was 16.2 per 1000 of the population, almost exactly the same as in all the cities for November and October. There were no deaths from scarlet-fever reported from the cities and only 1 from measles, and only 6 deaths from typhoid-fever in the eight cities from which the registrars have reported.

Bridgeport.—More sick than in November. Among adults we have typhoid-malaria ; among children diphtheria, croup, and bronchitis.

Griswold.—There are one or two cases of diphtheria, and whooping-cough and chicken-pox are quite common.

Haddam.—Typhoid-fever appears to be coming to the front again.

Hartford.—Measles, scarlet-fever, and diphtheria occur to a limited extent, but they can hardly be called epidemic. Pneumonia was more fatal than any other one disease. It was the cause of 13 deaths.

Madison.—The town still continues healthy. We have nothing more dignified than slight colds, sore throats, etc.

Meriden.—Prevailing diseases same as usual in the winter—pneumonia, bronchitis, influenza, and malarial-fevers.

New Haven.—December had the lowest death-rate—12.9—of any month in the year except January—12.4.

Norwalk.—Whooping-cough and mumps mildly prevalent, the latter in the male, showing a tendency to metastasis.

South Manchester.—Has been remarkably healthy, excepting for the occurrence of six or eight cases of diphtheria—one fatal.

Suffield.—Two cases of typhoid-fever last month, and an extensive epidemic of measles, which now prevail in nearly every section of the town. Otherwise the public health is good.

Waterbury.—The death-rate less than for any month during the year. Among children there is whooping-cough and mumps and some cases of diphtheria. On account of sudden atmospheric changes we have more pneumonia—one sixth of the mortality being caused by it. Typhoid-fever caused 3 deaths.

Watertown.—A few cases of whooping-cough.

Westport.—Scarlet-fever of mild type still lingers. Malaria prevails generally.

From the above reports it is quite evident that the health of the people of Connecticut during the last month of the year was exceptionally good.

DELAWARE.—*Wilmington* Board of Health report for the year ending December 31st, 1885, estimates the population at 55,800, an increase in five years of 13,401. White, 47,800; colored, 8000. Deaths reported, white, 804; colored, 215: 1019. Death-rates, white, 16.82; colored, 26.87: 18.26. From zymotic diseases there were 164, as follows: Diarrhœal diseases, 70; croup and diphtheria, 30; typhoid-fever, 25; intermittent-fever, 7; scarlet-fever, 6; malaria, 5; cerebro-spinal meningitis, erysipelas, puerperal-fever, and whooping-cough, each 4 (16); septicæmia, 3; remittent-fever, 2: 16.08 per cent of the whole. From consumption, bronchitis, and hæmorrhage of lungs, 186: 18.25 per cent of total. "Marasmus,

36; inanition, 26; natural causes, 34; old age, 20; and debility, 39," suggest a good many deaths from uncertain causes. Nevertheless, there has been a good deal of improvement since our review of the report for 1884 (Vol. XV., pp. 90 and 182), and a gratifying decrease of the death-rate—171 less, with an estimated increase of nearly 3000 in population. Yet the president of the Board still finds it necessary to urge the attention of the city council that "the long roll which the secretary reports every month and every year of wet cellars drained, alleys cleansed, ponds dried up, privies emptied, with a variety of other matters, all conspiring to depreciate the health of the people, and to become avenues of disease and death, has constituted the chief work of the Board."

For the month of December, 120 deaths, of which 64 were under five years of age. Death-rate per 1000, 25.81. There were 31 deaths from zymotic diseases and 16 from consumption.

GEORGIA.—*Augusta* Board of Health, for the year ending November 30th, 1885, reports considerable and, apparently, satisfactory progress in sewering the city, with corresponding results in the promotion of the public health.

"During the period 1871 to 1879 inclusive, the average annual death-rate per 1000 of population was 30. From 1880 to 1885 inclusive, it was 24; in other words, this decreased death-rate of our citizens amounts to an average annual saving of 210 lives each year during the latter period, according to equal number of population. The death-rate during the year just closed was the smallest within the history of Augusta, being only 21.33 (?) per 1000. The death-rate last year, 23.38 per 1000, is 33 per cent more than it should be under thorough sanitation. The remarkable decrease in our death-rate for the last six years encourages us to hope for yet greater decrease in the future."

The population is estimated at 36,000—20,500 white and 15,500 colored. Deaths reported, whites, 287; colored, 467: 754. Death-rates, white, 14.00; colored, 30.13: 20.94. Yet the proportion of deaths from zymotic diseases is large—195, or 25.86 per cent of all; but, excepting typhoid and malarial-fevers, from which there were 21 and 25 deaths respectively, there appears to have been no particular prevalence, and the

prevalence of these two especially, which added 46 to the number, adds special force to the remarks quoted in relation to the progress of sewerage and drainage.

ILLINOIS.—*Chicago*, with a population of 704,000, reports in December 1109 deaths, of which 460 were under five years of age. There were 266 deaths from zymotic diseases and 104 from consumption. The annual death-rate per 1000 was 18.91.

Rock Island, during the four weeks ending December 25th, 1886, reported 13 deaths in a population of 13,655, of which 6 were under five years of age. Death-rate per 1000, 12.3. No deaths reported from zymotic diseases, and but 1 from consumption.

LOUISIANA.—*New Orleans* reports for December 352 deaths in 173,500 white population, and 186 deaths in 64,500 colored population—making the respective death-rates 24.34 and 34.60 per 1000, and 27.12 per 1000 for the whole population of 238,000. The deaths from zymotic diseases numbered 58, and from consumption 84. There were 130 deaths under five years of age.

MARYLAND.—*Baltimore* reports 593 deaths in the four weeks ending December 25th in a population of 417,220, of which 201 were under five years of age. From zymotic diseases there were 114 deaths, and from consumption 83. The annual death-rate for the four weeks was 18.48.

MASSACHUSETTS.—The State Board has issued a "*Manual* containing the statutes relating to the public health and the decisions of the Supreme Court of Massachusetts relating to the same," which is full of information of practical utility to the health authorities and legislators of other States, as well as Massachusetts, who would profit by this outcome of the foremost State in the Union in the application of sanitary knowledge.

MICHIGAN.—For the month of December, 1886, compared with the preceding month, the reports indicate that pneu-

monia, tonsilitis, and neuralgia increased, and that remittent-fever, whooping-cough, and typhoid-fever decreased in prevalence.

Compared with the preceding month, the temperature in the month of December, 1886, was much lower, the relative humidity was much more, the absolute humidity and the day and the night ozone were less.

Compared with the average for the month of December in the eight years 1879–86, intermittent-fever, remittent-fever, typhoid-fever, diphtheria, consumption of lungs, bronchitis, and pneumonia were less prevalent in December, 1886.

For the month of December, 1886, compared with the average of corresponding months for the eight years 1879–86, the temperature was considerably lower, the absolute humidity was slightly less, the relative humidity and the day ozone were slightly more, and the night ozone was less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of December, 1886, at 71 places, scarlet-fever at 46 places, typhoid-fever at 26 places, measles at 16 places, and small-pox at Detroit.

Reports from all sources show diphtheria reported at 8 places more, scarlet-fever at 4 places more, typhoid-fever at 9 places less, measles at 5 places more, and small-pox at the same number of places in December, 1886, as in the preceding month.

Detroit.—The fifth annual report of the Board of Health for the year ending May 31st, 1886, is entirely statistical. Deaths reported (exclusive of 268 still-births), 3386, being 20.46 per 1000 of population ; 736 were of children under five ; 1148, or 33.87 per cent of all, were caused by zymotic diseases ; croup and diphtheria, 384 ; diarrhœal diseases, 287 ; scarlet-fever, 119 ; typhoid-fever, 44 ; intermittent-fever, 42 ; whooping-cough, 41 ; measles, 40 ; entero-colitis, 38 ; pyæmia, 20 ; erysipelas, 17—a formidable category surely, considering that Detroit is one of the best health-service equipped cities in the country. It can probably be accounted for by the continued tolerance of a disgraceful old sewerage system, continually growing from bad to worse. For the month of December, 1886, population, 175,000 ; deaths reported, 303, of which 129 were under five years of age. Death-rate, 20.38

per 1000. There were 87 deaths from zymotic diseases and 32 from consumption.

MISSOURI.—*St. Louis* Health Commissioner reports for the fiscal year ending March 31st, 1885, the general condition of the public institutions satisfactory, except their total inadequacy to the demands made upon them. This inadequacy is particularly shown, as it has been for several years, by the superintendents of the hospitals, insane asylum, and poorhouse severally. Population is estimated at 400,000. Deaths reported for the year, 7671 ; death-rate, 18.7, against 19.7 for the previous year, though with an increase in the number from the most prevalent zymotic diseases, diphtheria and scarlet-fever—426 of the former and 164 of the latter, against 356 and 161, respectively, for the preceding year. Total from zymotic diseases, 2057, or 26.77 *per cent* of the deaths from all causes —a percentage so large as to suggest a possible error in the estimate of population and consequent death-rate. Deaths from other prevalent zymotic diseases besides those named : Croup, 110 ; typhoid-fever, 123 ; remittent, intermittent, typho-malarial, congestive, and simple continued fevers, 260 ; diarrhœal diseases, 518 ; puerperal-fever, 66 ; measles, 164 ; small-pox, 36.

For the month of December, 1886, estimated population 400,000, there are reported 681 deaths, of which 245 were under five years of age. The death-rate was 20.43 per 1000. There were 181 deaths from zymotic diseases and 68 from consumption.

MINNESOTA.—In *Bulletin* for December the secretary calls attention to the marked coincidence of croup and laryngitis with diphtheria in Minneapolis, and the alternation of diphtheria and scarlatina in Stillwater, as noted by the health officers of those cities.

Minneapolis, Dr. Thomas F. Quimby, Health Officer, reports from August 1st, 1884, to December 1st, 1886, inclusive, the following cases of contagious diseases : Diphtheria, 789 ; scarlet-fever, 472 ; small-pox, 2 ; glanders, 1. The following deaths have taken place from the above diseases during the dates heretofore mentioned—viz.: From diphtheria, 275 ; from

scarlet-fever, 76; from glanders, 1. One case of small-pox reported proved to be varicella; the other was genuine. Was removed to pest-house and recovered. No other cases resulted therefrom. The case of glanders in man died.

Leprosy.—Dr. Chr. Gronvold, of the State Board, again reports on leprosy. The number of lepers known at present as living in Minnesota is 4. The number known to have died of the disease in the State since 1876 is increased by 4 since last report in 1884, and comprises at present 11 cases. He gives an interesting account of the introduction and progress of the disease in the Sandwich Islands, which we purpose erelong to make room for entire.

Small-pox in Minnesota from August, 1884, to December, 1886: Fifteen outbreaks, 7 counties invaded, 47 cases, 3 deaths. The latest case reported was on October 26th, 1886.

NEW JERSEY.—*Hudson County* Board of Health reports for the year ending December 31st, 1885, population of 246,000; 5616 deaths; death-rate, 23.4—against an average of 23.6 for eleven years. Deaths under five years of age, 2588; 1433 of all were caused by zymotic diseases, the chief of which were: Croup and diphtheria, 377; scarlet-fever, 245; typhoid-fever, 96; whooping-cough, 64; cerebro-spinal-fever, 34; entero-colitis, 56; diarrhœal diseases, 301. Consumption, 656, or 11.69 per cent of the deaths from all causes.

For the month of December, 1886, there are reported 452 deaths in a population estimated at 250,734, 172 of which were under five years of age. The death-rate is shown to be 21.7 per 1000. There were 77 deaths from zymotic diseases and 75 from consumption.

NEW YORK.—The total reported mortality, by State Board *Bulletin*, from 123 cities and towns, comprising 3,456,658 inhabitants, for the month of December, is 7603, of which 37 per cent were under the age of five years. From zymotic diseases there were 1516 deaths, a ratio of 200 per 1000 total mortality. From *diarrhœal* diseases, the ratio per 1000 is 14.08; from *typhoid-fever*, 14.73; from *croup and diphtheria*, 87.37. From *consumption* the ratio of mortality is 137.87 per 1000, and 221.12 per 1000 above the age of five years. The

combined death-ratio per 1000 from *zymotic diseases*, *consumption*, and *puerperal* diseases is 345.53. No cases of small-pox occurred in the State outside of Brooklyn. From acute respiratory diseases there were 187.76 deaths per 1000 total mortality. Yonkers and Elmira fail to report this month.

Summary of mortality of the State for the year 1886, the ratio per 1000 of deaths from all zymotic diseases to the total mortality was 217.23, against 222.17 in 1885, and 269.12 in 1884. The conjoined death-rate per 1000 from typhoid-fever and diarrhœal diseases was 146.40 in 1884, 104.07 in 1885, and 94.44 in 1886, showing a continued reduction. On the other hand, diphtheria, which, as noted in the last annual summary, is caused more by insanitary conditions of households, and not so susceptible to public hygienic improvements, has prevailed more extensively, having had a death-rate in 1884 of 47.65 per 1000, of 56.06 in 1885, and of 64.48 in 1886. Whooping-cough has also caused a large death-rate; the other more common zymotic diseases have been materially less prevalent than in 1885. Typhus-fever caused 26 deaths in the Albany Penitentiary early in the year; small-pox caused but two deaths outside of New York and Brooklyn.

About 3000 certificates of death have been received during the year too late for record in the *Bulletin*, making the total reported deaths in the State about 90,000, against about 84,000 in 1884. Estimating the present population of the State at 5,500,000, a death-rate of 18 per 1000 would give about 100,000 total mortality. Each year more complete returns are secured.

New York City, 1,439,000: Deaths for the month, 3502; under five years, 1532; of *zymotic diseases* per 1000 deaths from all causes, 230.57. By *croup* and *diphtheria*, 336; *typhoid-fever*, 33; *measles*, 271; *malarial diseases*, 32; *whooping-cough*, 11; *diarrhœal diseases*, 65; *consumption*, 478; *acute respiratory diseases*, 729. Death-rate, 28.65.

During the year 1886 37,351 deaths occurred in the city, which is an increase of 1669 compared with the number of deaths that took place during the preceding year, and represents an annual death-rate of 25.96 per 1000 of the population, which was estimated in the middle of the year at 1,439,037. The following classes of disease showed an increase compared

with the preceding year—viz.: Zymotic diseases, 560; constitutional diseases, 444; local diseases, 441; developmental diseases, 106; and deaths from violence, 118.

During the year small-pox caused 31 deaths; measles, 668; scarlatina, 371; diphtheria, 1727; croup, 968; whooping-cough, 575; typhus-fever, 14; typhoid-fever, 325; cerebro-spinal meningitis, 223; puerperal diseases, 371; malarial-fevers, 394; yellow-fever, 1; diarrhœal diseases, 3494—of this number 2990 were under five years of age; erysipelas, 140; inanition, 222; alcoholism, 210; rheumatism and gout, 157; cancer, 780; phthisis pulmonalis, 5477; bronchitis, 1701; pneumonia, 3657; diseases of the heart, 1894; aneurism, 77; marasmus and scrofula, 990; hydrocephalus and tubercular meningitis, 751; meningitis and encephalitis, 885; convulsions, 541; effects of solar heat, 42; apoplexy, 762; enteritis, gastritis, gastro-enteritis, and peritonitis, 1190; cirrhosis and hepatitis, 366; Bright's disease and nephritis, 2216; cyanosis and atelectasis, 292; all diseases of the nervous system, 3156; suicide, 224; premature and preternatural births, 823; drowning, 199; and surgical operations, 90.

Nine thousand eight hundred and fifty of those who died during the year were under 1 year, 13,038 were under 2 years, 16,121 were under 5 years, and 2479 persons were 70 years and upward.

Compared with the year 1885, small-pox showed an increase of 5 deaths; diphtheria, 402; croup, 113; whooping-cough, 80; typhoid-fever, 31; cerebro-spinal-fever, 21; diarrhœal diseases, 68; inanition, 25; alcoholism, 49; cancer, 26; phthisis pulmonalis, 281; bronchitis, 96; pneumonia, 8; diseases of the heart, 83; marasmus and scrofula, 80; hydrocephalus and tubercular meningitis, 85; meningitis and encephalitis, 26; apoplexy, 34; enteritis, gastritis, gastro-enteritis, and peritonitis, 127; cirrhosis and hepatitis, 30; Bright's disease and nephritis, 122; suicide, 17; premature and preternatural births, 103; drowning, 13; and surgical operations, 2.

The number of deaths reported in tenement-houses from small-pox was 3; from measles, 538; from scarlatina, 282; from diphtheria, 1255; from whooping-cough, 432; and from typhoid-fever, 133. The deaths in institutions from small-

pox were 26; measles, 33; scarlatina, 21; diphtheria, 76; croup, 50; whooping-cough, 27; typhus fever, 14; typhoid-fever, 118; and yellow-fever, 1.

The number of deaths reported to have occurred during the year 1886 in tenement-houses was 21,454; in houses containing 3 families and less, 7824; in streets, rivers, etc., 526; and in institutions, 7128.

Brooklyn, 690,000: Deaths, 1451; under five years, 628; of zymotic diseases per 1000 deaths from all causes, 219.85. By *croup* and *diphtheria*, 130; *typhoid-fever*, 18; *malarial* diseases, 32; *whooping-cough*, 9; *scarlet-fever*, 26; *measles*, 53; *small-pox*, 14; *diarrhœal diseases*, 6; *consumption*, 203; acute pulmonary diseases, 343. Death-rate, 24.73. During the year 1886, total number of deaths in Brooklyn, 15,790—321 more than for previous year; from zymotic diseases, 4052—73 less than for previous year. Deaths from prevailing zymotic diseases, in the order of their greater prevalence, and in comparison with previous year were: from *diarrhœal diseases*, 1398—decrease, 456; *diphtheria* and *croup*, 1185—increase, 353; *scarlet fever*, 340—decrease, 23; *whooping-cough*, 260—increase, 103; *typhoid-fever*, 123—decrease, 30; measles, 106—decrease, 69; *typho-malarial-fever*, 90—decrease, 4; *remittent-fever*, 85—increase, 13; *erysipelas*, 65—decrease, 13; *small-pox* (including deaths in county hospital), 36—increase, 34; other zymotics, 87—decrease, 5. Death-rate, 21.71—decrease (from 22.09), .38.

Small-pox continues to hold its own, despite the efforts of the vaccinating corps, the number of unvaccinated persons and those who refuse vaccination being sufficient to sustain it. During the month of January 41 cases, with 15 deaths (including those who died in the county hospital), were reported. Both cases and deaths—the latter exclusively—are almost wholly limited to persons who have never been vaccinated.

Buffalo, 202,818: Deaths (for four weeks, ending December 25th), 287; under five years, 136; of zymotic diseases per 1000 deaths from all causes, 245. By *croup* and *diphtheria*, 34; *typhoid-fever*, 5; *malarial* diseases, 2; *diarrhœal* diseases, 5; *consumption*, 33; *acute respiratory diseases*, 30. Death-rate, 18.39.

Rochester, 101,000: Deaths, 154; under five years, 57; of

zymotic diseases per 1000 deaths from all causes, 227.28. By *croup* and *diphtheria*, 25; diarrhœal diseases, 2; *typhoid-fever*, 4; *consumption*, 23; *acute respiratory diseases*, 23. Death-rate, 18.22. The *lowest* death-rates of any city in the State of 10,000 population and upward was that of Lockport, 9. The *highest* death-rate of any of 10,000 population and upward was that of New York, 28.65. The *lowest death-rate* of any city or town, regardless of population, was that of Fort Edward (4800), 2.5. The *highest death-rate* was that of Nyack (5000), 43.20.

NORTH CAROLINA.—*Bulletin* for December summarizes reports from 44 counties. Of infectious diseases, *whooping-cough* continues to be the most prevalent—reported in 13 counties; *typhoid-fever* in 12 counties; *diphtheria* in 11 counties; *malarial-fever* and *hemorrhagic malarial-fever*, each in 5 counties; *scarlet-fever* and *measles*, each 4 counties. Reports from five of the larger towns, deaths from infectious diseases: *Typhoid-fever*, in Wilmington, 4; Raleigh, 1. *Typho-malarial-fever*, in Wilmington, 2. *Diphtheria*, in Raleigh, 1. *Whooping-cough*, in Ashville, 2. *Cerebro-spinal meningitis*, in Wilmington, 1.

OHIO.—Weekly *Bulletin*, for the five weeks ending December 31st, from 75 observers, shows the most prevalent infectious diseases and in the order of their greater prevalence to be *measles*, *diphtheria* and *croup*, *scarlet-fever*, *whooping-cough*, *typhoid-fever*, and *small-pox;* and of *increasing* prevalence, measles, diphtheria, and scarlet-fever.

Cincinnati reports for the month of December 632 deaths in 325,000 of population, making the annual rate per 1000, 23.33. From zymotic diseases there were 151 deaths, and from consumption 74. There were 299 deaths under five years of age.

Toledo reports 81 deaths in December, of which 32 were under five years of age. From zymotics there were 22 deaths, and from consumption 8.

PENNSYLVANIA.—*Philadelphia* reports during four weeks ending December 25th, 1886, 1582 deaths in 971,363 of population, of which 531 were under five years of age. Death-rate

per 1000, 21.16. From zymotic diseases there were 249 deaths, and from consumption 218.

Pittsburg, for four weeks ending December 25th, 1886, reports 345 deaths in a population of 200,000, of which 157 were under five years of age. Death-rate per 1000, 21.25. From zymotic diseases there were reported 82 deaths, and from consumption 25 deaths.

Erie reports for December 58 deaths in 33,215 of population, of which 31 were under the age of five years. Rate per 1000, 20.9. There were 28 deaths due to zymotic diseases, and 3 to consumption.

RHODE ISLAND.—*Providence*, Dr. E. M. Snow, Registrar of Vital Statistics, reports for the year ending December 31, 1885: Population, 118,070; births, 2936—24.87 per 1000; marriages, 1091—9.24 per 1000; deaths, 2164—18.32 per 1000. The ratio of persons married (2182) to births was 74.32 to 100; of persons married to deaths, 100.8 to 100; of births to deaths, 100 to 100; average over thirty years, 100 to 103.9.

"As a rule, the greatest mortality in Providence is in the third quarter of the year and the least in the second quarter, and this is true in the aggregate mortality for a series of years. But the prevalence of epidemic diseases, and sometimes other causes, make some exceptions to this rule, and we find that, *during the thirty-one years* included in this series of reports, the deaths in the different quarters of the year have been as follows: January–March, greatest in 4 years, smallest in 6 years; April–June, greatest in 1 year, smallest in 18 years; July–September, greatest in 24 years, smallest in none; October–December, greatest in 2 years, smallest in 7 years. This shows that the quarterly number of deaths has been the greatest, and the smallest in each quarter of some one of the thirty-one years, except that it has never been the smallest in the third quarter. Still, the general rule remains as stated."

For the month of December, 1886, the number of deaths was 187, representing an annual rate of 18.70 per 1000 of population (120,000); 56, or 29.95 per cent, were under five years; 45, or 24.06 per cent of all, were caused by zymotic diseases—*diphtheria* and *croup*, 18; *typhoid-fever*, 6; *measles*, 7; *scarlet-fever*, 5. During the whole year of 1886 the num-

ber of deaths was 2355 ; annual rate, 19.62 ; 529, or 22.46 per cent, were caused by zymotic diseases.

Newport.—First annual report, for 1885. The Board was not organized till February 11th, 1885, and its report is necessarily incomplete. The population of the city is estimated at 19,566 ; number of deaths reported, 264 ; from zymotic diseases—chiefly from *scarlet-fever* (24)—32. Annual rate, by the record, 13.5. The attention of the Board has been chiefly devoted to the abatement of privy vaults and cesspools, and to the promotion of sewerage, and has made creditable headway—anticipated of the forthcoming report for 1886.

TENNESSEE.—The month of December was remarkable for probably the lowest minimum temperature for many years past. The daily ranges of temperature were generally wide, going as high as 46° on the 7th and 8th. The effect is seen in the great increase in catarrhs and acute lung affections, also in the greater severity of many chronic diseases.

It is to be noted that the epidemic of diphtheria in McMinn County is finally ended.

The principal diseases, named in the order of their greater prevalence, in the State for December were, *pneumonia, malarial-fever, typhoid-fever, bronchitis, rheumatism, tonsilitis, and catarrhal-fever.*

Measles are reported in the counties of Crockett, Davidson, DeKalb, Hamilton, Haywood, Jackson, Macon, Maury, Montgomery, Robertson, Rutherford, Sumner, Williamson, and Wilson ; *whooping-cough* in Blount, Crockett, Davidson, Hancock, Jefferson, Madison, Obion, Rutherford, Stewart, and Washington ; *mumps* in Blount, Loudon, Macon, Polk, and Sevier ; *scarlet-fever* in Gibson, Montgomery, Rhea, Rutherford, Shelby, and Stewart ; *diphtheria* in Davidson, Hamilton, Knox, Montgomery, Shelby, and Stewart ; *erysipelas* in Dyer, Henry, Montgomery, and Sumner ; *influenza* in Henry and Putnam ; *chicken-pox* in Gibson County.

Death Rates.	Chattanooga,	white,	16.94 ;	colored,	37.09 :	24.85
" "	Clarksville,	"	24.00 ;	"	12.00 :	19.50
" "	Columbia,	"	15.05 ;	"	6.44 :	11.29
" "	Knoxville,	"	19.51 ;	"	30.27 :	21.91
" "	Memphis,	"	16.40 ;	"	26.56 :	20.02
" "	Nashville,	"	17.80 ;	"	26.08 :	20.79

The death-rates for the year 1886 were, of

Chattanooga,	white,	18.41 ;	colored,	31.81 :	23.67
Knoxville,	"	11.29 ;	"	28.64 :	15.17
Memphis,	"	16.81 ;	"	33.85 :	22.86
Nashville,	"	13.95 ;	"	29.25 :	19.46

VIRGINIA.—*Richmond* reports 155 deaths in 100,000 of population—66 deaths in 56,000 of white population and 89 deaths in 44,000 colored population—making the death-rates 14.14 for the whites, 24.27 for the colored, and 18.60 for the whole. From zymotic diseases there were 25 deaths, and from consumption 25. The deaths under five years of age numbered 56.

WISCONSIN.—*Milwaukee* had 212 deaths in December, in its population of 167,000, of which 58 were under five years of age. The death-rate is shown to be 15.2 per 1000. There were 45 deaths from zymotic diseases and 22 from consumption.

VITAL STATISTICS OF IMMIGRATION AT THE PORT OF NEW YORK FOR JANUARY, 1886.—(6) Scotia, Marseilles, 412 passengers, 1 death ; (13) Wisconsin, Liverpool, 174 passengers, 1 death ; (17) La Champagne, Havre, 151 passengers, 1 death ; (17) Adriatic, Liverpool, 311 passengers, 1 death ; (22) Zaandam, Amsterdam, 112 passengers, 1 death, 1 birth ; (27) Devonia, Glasgow, 264 passengers, 1 death ; (31) Britannia, Marseilles, 437 passengers, 1 death ; (31) Saale, Bremen, 364 passengers, 1 death.

Total passengers, 2225 ; deaths, 8 ; births, 1.

MORTALITY AND MORBILITY STATISTICS ABROAD, summarized from the most recent sanitary reports received through the Department of State, issued by Dr. John B. Hamilton, M.D., Surgeon-General of the Marine Hospital Service, by direction of the Secretary of the Treasury, and other sources.

England and Wales.—The deaths registered in 28 great towns of England and Wales during the week ended January 22d, 1887, correspond to an annual death-rate of 22.8 per 1000 of aggregate population. The lowest death-rate was recorded in Derby, viz., 15.0, and the highest in Plymouth, viz., 33.8. There were 1757 deaths registered in London dur-

ing the week, including 16 from *scarlet-fever*, 13 from *diphtheria*, 31 from *whooping-cough*, 14 from *enteric-fever*, and 13 from *diarrhœa* and *dysentery*.

Ireland.—The average annual death-rate represented by the deaths registered during the week ended January 22d, in the 16 principal town districts of Ireland was 29.1 per 1000. The lowest death-rate was recorded in Galway, viz., 16.8, and the highest in Lurgan, viz., 51.3. Dublin—there were 218 deaths registered during the week, including 15 from *zymotic diseases*. In 45 instances the cause of death was uncertified, there having been no medical attendant during the last illness.

Scotland.—The death-rate in 8 principal towns during the week ended January 22d was 23.7 per 1000. The lowest mortality was recorded in Perth, viz., 9.7, and the highest in Paisley, viz., 30.8 per 1000.

Glasgow.—There were 279 deaths registered during the week ended January 22d, including 9 from *scarlet-fever* and 8 from *diphtheria*. Death-rate, 26.6.

Edinburgh.—There were 103 deaths registered during the week ended January 15th, including 2 from *scarlet-fever*. Death-rate, 20.7.

Germany.—The deaths registered in 52 cities in Germany, having an aggregate population of 6,523,266, during the week ended January 8th, correspond to an annual death-rate of 19.4 per 1000. The lowest rate was recorded in Mayence, viz., 9.1, and the highest in Breslau, 34.6.

Havana.—There were 99 deaths registered during the week ended January 20th, including 1 from *yellow-fever*. Death-rate, 24.8.

Guayaquil.—There were 79 deaths registered during the week ended January 13th, including 25 from *yellow-fever*, 3 from *small-pox*, and 21 from *enteric-fever*. Death-rate 117.6.

Para.—During the two weeks ended January 9th there were 87 deaths from all causes, including 9 from *yellow-fever*.

Genoa.—The United States consul, in his dispatch of January 13th, incloses a report from Dr. Ferrara, under date of the 10th instant, from which it appears that, in 1886, two epidemics existed, one of cholera and the other of small-pox. During the year 1886 there were 700 *cases declared to be Asiatic cholera*, of which 500 proved fatal. The municipal authorities

attended to the cleanliness of the town by having all the streets and lanes washed every night. They disinfected all the sewers, and washed the public lavatories with a solution of corrosive sublimate. Particular attention was paid to the disinfection of clothing and furniture. *During the epidemic of small-pox* which existed in Genoa from November, 1885, to July, 1885, there were 280 *cases* in the small-pox hospital, of which 47 proved fatal.

Mayence.—The United States commercial agent at Mayence, in his dispatch of January 8th, incloses a communication from the Hessian Government, in which it is stated that, in the cases of diarrhœa accompanied with vomiting, which appeared in the communes of Gonsenheim and Finthen, near Mayence, in the months of September and October, 1886, regarded as cases of native cholera, and first brought to official notice in the second half of the month of October, it was possible in but one instance, in the examination of a dead body, and once in a case ending in convalescence, to prove, microscopically and bacteriologically, the presence of Koch's bacilli. The medical authorities are not ready to say, at least as regards the majority of the cases which occurred, that it was Asiatic cholera. The post-mortem examination, on the 27th of October, of the last victim did not in itself justify a diagnosis of Asiatic cholera. The result of a microscopical and bacteriological examination of the contents of the intestines, October 29th, by experts, established the presence of Koch's bacilli, and thereby a diagnosis of Asiatic cholera was justified. On the 29th of October, in the case of a person sick with simple diarrhœa, the presence of Koch's bacilli in the evacuations was established. In Gonsenheim (3229 inhabitants), during the time from September 17th to October 13th, there were 9 persons taken sick with symptoms of diarrhœa combined with vomiting, of whom 6 died. In Finthen (2365 inhabitants), from September 25th to October 27th, there were 10 persons taken sick, of whom 8 died. The duration of the sickness varied. In a few cases, with a rapid course ending fatally, the symptoms lasted only seven to twelve hours. On the average, the length of sickness noted was one and one half to two days.

San Juan del Norte.—There were 5 cases of *small-pox* registered during the three weeks ended January 3d.

Rheims.—There were 52 deaths registered during the week ended January 22d, including 1 from *small-pox*, 2 from *diphtheria*, 3 from *scarlet-fever*, and 2 from *whooping-cough*; scarlet-fever prevails. Death-rate, 27.6.

Leghorn.—There were 56 deaths registered during the week ended January 23d, including 1 from *enteric-fever*. There were 2 cases of *small-pox* reported, but no deaths from that disease. Death-rate, 30.9.

Toronto.—There were 25 deaths registered during the week ended January 29th, including 1 from *diphtheria*. Death-rate, 10.8.

St. Thomas.—There were 8 deaths registered during the week ended January 21st, including 1 from *leprosy* and 1 from *small-pox*. Death-rate, 27.8.

Bordeaux.—There were 152 deaths registered during the week ended January 8th, including 3 from *enteric-fever*. Death-rate, 35.8.

Rotterdam.—There were 110 deaths registered during the week ended January 15th, including 4 from *scarlet-fever*. Death-rate, 30.1.

Trieste.—There were 111 deaths registered during the week ended January 15th, including 1 from *enteric-fever*, 1 from *scarlet-fever*, and 1 from *diphtheria*. Death-rate, 38.5.

Leipsic.—There were 57 deaths registered during the week ended January 22d, including 7 from *diphtheria*. Death-rate, 17.4.

Munich.—There were 103 deaths registered during the week ended January 15th, including 3 from *scarlet-fever* and 3 from *diphtheria*. Death-rate, 20.5.

Brussels.—There were 193 deaths for the week ending January 22d, including 2 from *typhoid-fever*, 7 from *croup* and *diphtheria*, and 2 from *whooping-cough*. Death-rate, 23.3.

Anvers.—There were 77 deaths for the week ending January 22d, including 3 from *measles*, 1 from *typhoid-fever*, and 2 from *croup* and *diphtheria*.

Amsterdam.—There were 163 deaths recorded during the week ending January 15th, including 2 from *measles*, 5 from *diphtheria* and *croup* and 1 from *whooping-cough*. Death-rate, 22.3.

Paris.—There were 1128 deaths recorded during the week

ending January 22d, including 3 from *small-pox*, 37 from *measles*, 3 from *scarlet-fever*, 29 from *typhoid-fever*, 23 from *diphtheria* and *croup*, and 11 from *whooping-cough*. Death-rate, 26.1.

Marseilles.—During the month of December there were 965 deaths recorded, including 17 from *small-pox*, 33 from *typhoid-fever*, 60 from *diphtheria* and *croup*, 1 each from *measles* and *whooping-cough*. Death-rate, 30.8.

Vienna.—There were 347 deaths recorded during the week ending January 15th, including 3 each from *measles* and *scarlet-fever*, 6 from *diptheria* and *croup*, and 1 each from *typhoid-fever* and *whooping-cough*. Death-rate, 22.8.

Pesth.—Two hundred and ninety-five deaths were recorded during the week ending January 15th, including 29 from *small-pox*, 9 from *scarlet-fever*, 1 from *typhoid-fever*, and 17 from *croup* and *diphtheria*. Death-rate, 35.5.

Prague.—There were 174 deaths recorded during the week ending January 15th, including 4 from *small-pox*, 2 each from *measles*, *scarlet-fever*, and *typhoid-fever*, 15 from *diphtheria*, and 5 from *whooping-cough*. Death-rate, 31.4.

St. Petersburg.—Five hundred and sixty-four deaths were recorded during the week ending January 8th, including 7 from *small-pox*, 2 from *measles*, 10 from *scarlet-fever*, 24 from *typhoid-fever*, 18 from *diphtheria* and *croup*, and 8 from *whooping-cough*. Death-rate, 31.6.

Warsaw.—One hundred and ninety-nine deaths were recorded during the week ending January 15th, including 7 from *small-pox*, 2 each from *measles* and *scarlet-fever*, 1 from *typhoid-fever*, and 13 from *diphtheria* and *croup*. Death-rate, 23.9.

Odessa.—Two hundred and forty deaths were recorded during the week ending January 15th, including 3 from *scarlet-fever*, 2 from *diphtheria* and *croup*, and 1 each from *typhoid-fever* and *whooping-cough*. Death-rate, 34.0.

Rome.—Two hundred and forty deaths were recorded during the week ending January 11th, including 26 from *small-pox*, 8 from *typhoid-fever*, and 4 from *diphtheria* and *croup*. Death-rate, 35.4.

Turin.—Two hundred and thirteen deaths were recorded December 11th–20th, including 1 each from *small-pox*, *scarlet-*

fever, and *whooping-cough*, 2 from *measles*, 6 from *typhoid-fever*, and 9 from *diphtheria* and *croup*. Death-rate, 27.5.

Venice.—Eighty-one deaths were recorded during the week ending January 15th, including 1 each from *small pox*, *measles*, and *typhoid-fever*. Death-rate, 29.0.

Bucharest.—One hundred deaths were recorded during the week ending January 15th, including 6 from *measles*, 2 from *typhoid-fever*, 7 from *diphtheria* and *croup*, and 1 from *whooping-cough*. Death-rate, 26.0.

Cairo.—Two hundred and eighty-four deaths were recorded during the week ending December 30th, including 3 from *small-pox*, 14 from *typhoid-fever*, 6 from *diphtheria* and *croup*, and 7 from *whooping-cough*. Death-rate, 41.8.

Alexandria.—One hundred and fifty-four deaths were recorded during the week ending December 30th, including 1 each from *typhoid-fever* and *diphtheria* and 6 from *whooping-cough*. Death-rate, 44.0.

Port Said.—Nine deaths were recorded during the week ending December 30th, including 3 from *small-pox*. Death-rate, 43.8.

Bombay.—Three hundred and forty-five deaths were recorded during the week ending December 28th, including 102 from "*fevers*." Death-rate, 20.0.

Calcutta.—Three hundred and twenty-eight deaths were recorded December 5th–11th, including 84 from "*fevers*." Death-rate, 33.4.

Madras.—Three hundred and seventeen deaths were recorded December 4th–10th, including 75 from "*fevers*." Death-rate, 41.3.

CHOLERA IN SOUTH AMERICA.

Buenos Ayres.—The United States minister, in his dispatch dated December 16th, 1886, states as follows:

"Referring to my No. 58, under date of the 3d instant, I may add the cholera is on a steady increase here, and that it has assumed more deadly features. Thirty-six new cases were reported to the Board of Public Assistance of Buenos Ayres yesterday, more than half of which died in a very few hours. The worst of all lies in the fact of its rapid spread throughout the outside provinces. This dreadful disease,

'which walketh at night and wasteth at noonday,' leaps the prudence of quarantine, and breaks down every line of military cordon. It is still raging fiercely at Rosario, and has recently broken out at Cordova, Tucuman, Zarati, Bahia, Blanco, and Azul, and, worse than that, has gained a foothold on the island of Martin Garcia, where 5000 terrified immigrants are detained in quarantine, without sufficient food or shelter. We have great fears of appalling results there.

"These fears are based on rumors, and now furnished the department as such. I have watched every movement of the Government carefully, and though there may have been mistakes, both by omission and commission, not above criticism, I cannot discover any lacking on the part of the machinery of the Government to do actively and liberally all that seems best. The country of course is filled with terror, and at such a time very naturally the power of reason and the exercise of good judgment are not at their best."

The dispatch of December 3d, referred to above, states that:

"For the month of November just closed the official reports of the cholera hospital in Buenos Ayres show there were 200 patients entered—93 deaths, 34 cured, with 73 still under treatment.

"The greater part of the cases have originated in the 'boca' where the infected ship Perseo landed, which is a scooped-out place, so deep and below the level of the river Platte that ships may enter and discharge. It is, therefore, necessarily a vast receptacle of filth, and, there being no current to carry out its accumulations into the river beyond the sluggish action of the tide, it remains there a perpetual cesspool charged with disease and death. The Government, however, is already busy at work there with an immense force, devising means to sweeten its baleful waters by the use of powerful pumps and dredges.

"The disease is most fatal at Rosario, a city of commercial importance, on the Pasaka River, 200 miles away, where the most of the Perseo's passengers and cargo were discharged. The reports from that locality are truly distressing. In a population of about 50,000 souls they are now having from 35 to 50 deaths per day. In their cholera hospital alone there

were over 200 patients in November, of which more than one half died ; but there the disease has invaded the homes of the best and most prudent families of the city. Cordova and other inland cities are also becoming infected."

Cholera has appeared at Corumba, a Brazilian port on the Upper Paraguay, and at the extreme south-west of the vast Brazilian territory. The Government has chartered a steamer to convey medicines and physicians, and expects to be able to prevent the disease spreading, at all events to the eastern settlements, which prevention will be the more easy as a broad extent of virtually uninhabited country intervenes. But the sanitary conditions of the settlements along the Upper Paraguay and its affluents are not good, and it is not improbable that the disease may sweep along and devastate them.

In Uruguay cholera is reported extinct, the few cases which had occurred in a part of Montevideo having been carefully isolated.

Chili and Peru.—The United States minister at Lima, in his dispatch under date of January 5th, 1887, states that prohibition is made against all ships from Chili leaving her ports after December 20th ; that the measure is precautionary, and the immediate provocation he understands to be the appearance of *cholera in Chili, at San Felipe*, which town is said to contain about 10,000 people, and is the capital of the province of Aconcagua, situated near the base of the Andes, some 38 or 40 miles north of Santiago. A telegram on the 2d instant reported as having occurred there 55 *cases* and 40 *deaths*, but on the succeeding day there were no new cases. The same telegram reported that vigorous measures had been taken and the locality had been isolated by a sanitary cordon. A telegram received from Chili, dated the 5th instant (January), communicated through the Chilian legation here (Lima), reported that the first case of cholera occurred December 26th, in the east of Aconcagua, and that the epidemic district, circumscribed to a square league, is absolutely isolated by the army in three successive lines of sanitary cordon, and it is hoped to extinguish it.

LITERARY NOTICES.

TRANSACTIONS OF THE COLORADO STATE MEDICAL SOCIETY. Fifteenth and Sixteenth Annual Conventions, Denver, June, 1885, and June, 1886. Pp. 212. The leading paper, immediately following minutes of proceedings, 1885, is a paper on "Is Consumption Indigenous to Colorado?" by E. A. Lee, M.D., of Fort Collins. The conclusions of the paper are based upon eighty replies to a circular addressed to one hundred and ten physicians of the State, asking a report of the number of cases originating in Colorado falling under their respective observations during the last two years. Fourteen cases only are reported with the results thus far. Assuming that the eighty physicians who responded to the circular represent about half of the medical practitioners of the State, Dr. Lee reckons that double the number of cases and deaths reported (28 cases and 10 deaths), or "14 cases with 5 deaths annually for a population, as nearly as can at this time be ascertained, of 240,000," would represent the approximate ratio: "Making one and one sixth cases to every 20,000 population, with only one death practically to every 50,000 of population, and while we have good authority for stating that there is an average of 35 deaths annually from consumption to every 10,000 of the population of the United States, a comparison of these figures certainly results very favorably to Colorado."

The only paper bearing on preventive medicine is "Bacteria and their Relations to Infectious Diseases," by F. H. Lay, M.D., in which is given a lucid historical sketch of the subject and of the progress made by Pasteur and others in the practical application of bacteriology for the prevention of disease.

Of the presidential addresses, that of Dr. Jesse Hawes, for 1885, is chiefly devoted to a higher standard of preliminary and medical education, and in advocacy of a State Medical Examination Board, to meet the inset of medical practitioners into the State—nearly one third of the six hundred and sixty practitioners of the State having entered it within the last four years.

The address of Dr. J. C. Davis, for 1886, summarizes medical progress, and lays special emphasis on the long strides in recent years of preventive medicine.

For the rest: Fourteen stated papers and reports on curative medicine and surgery, and "A Plea for Medical Examiners in Place of Coroners," by J. N. Hall, M.D., are of interest to all medical practitioners.

HOUSE-PLANTS AS SANITARY AGENTS; OR, THE RELATION OF GROWING VEGETATION TO HEALTH AND DISEASE. Comprising also a consideration of the subject of Practical Floriculture, and of the Sanitary Influences of Forests and Plantations. By JAMES ANVERS, M.D., Ph.D., lately Lecturer on Botany in the Wagner Free Institute of Science; Member of the "Bureau of Scientific Information," Academy of Natural Sciences, Chair of Forestry, and the Relation of Plant Life to Health; Assistant Physician to the Episcopal Hospital, etc. 12mo, pp. 324. Philadelphia: J. B. Lippincott Company.

We have here summed up a great deal of useful knowledge on a most important subject, comprehending a thorough acquaintance with the conditions of plant life and its bearing upon human health and life, under a great variety of circumstances. The popular fallacy that the breathing of house-plants in the night-time contaminates the atmosphere, which was so effectually exploded by the experiments of Pettenkofer a few years ago, has lacked just such further elaboration as the volume before us affords, that they are not only devoid of any injurious influence, but, on the contrary, salutary in their effects, and worthy to be placed in the foremost rank of sanitary agencies indoors, as well as out; that in the house, garden, park, and forest, and above all on the streets of cities, flowers, plants, and trees, adapted to the various conditions of locality, are everywhere promotive of health. The theories of Professor Tommasi Crudeli and others, who allege that cultivation of plants favors the development of "malaria," without taking pains to discriminate between the results of putrefactive vegetable matter—consequent upon the neglect of proper care in their cultivation—are effectually overthrown by a multitude of facts and logical conclusions therefrom, under such a variety of circumstances, as to leave no room for doubt that of all

agencies antidotal to "malaria," vegetation is the most potential. The concluding chapters on the salutary influence of forests on consumptives is well shown, and fortified by the opinions of other good observers. The work is alike commendable to physicians and laymen.

REPORT ON THE DRINKING WATERS OF THE TOWNS AND VILLAGES OF MARYLAND, by Drs. Jackson Piper, John Morris, and J. M. H. Bateman, a committee of the State Board of Health, is a pamphlet of nineteen pages, is a cogent paper worthy of the widest possible circulation for the instruction of the people.

ATMOSPHERIC PURIFICATION, a pamphlet of twenty pages, reprint from *American Practitioner and News*, April, 1886, by David Prince, M.D., Jacksonville, Ill., is an illustrated paper with a device showing how the air may be purified by filtration through cotton, water-spray, or disinfectants in solution or the fumes of sulphur. The paper shows a good deal of practical ingenuity on the part of the author in an inviting field for progressive work.

REPLY TO THE REPORT OF MR. GLENN BROWN ON EXPERIMENTS IN TRAP SYPHONAGE AT THE MUSEUM OF HYGIENE (an abstract of which was published in THE SANITARIAN for January), by J. Pickering Putnam, architect, Boston, Mass. Mr. Putnam pretty clearly shows that some of Mr. Brown's conclusions are doubtful; that the seals of ventilated traps are not always secure against adverse influences; that back pressure may be easily and safely provided for by simple means without the aid of the trap vent-pipe.

TYPHOID-FEVER IN LOUISVILLE.— The *Indiana Medical Journal* for November publishes an abstract of a paper read by Dr. J. M. Clemens, of Louisville, at the September meeting of the Louisville Medical Society, upon the recent scourge of typhoid-fever in that city.

During the year just closed there were 117 deaths. The mortality was 10 per cent, representing 1200 cases in a population of 200,000.

The water-supply is by open surface wells, deep driven wells, and water works. Most of the cases were among those using water from open wells.

Louisville is built upon an alluvial deposit. The Ohio curves about the city, giving off a sheet of "ground water," which passes under the city, following the general course of the river from north-east to south-west. The ground water varies from twenty-five to sixty feet below the surface, as the surface itself varies, and as the river is either high or low. During the floods the water in the privy vaults rises and falls with the rise and fall of the river. There is an average of thirty to forty of these vaults to each street corner pump, and most of the typhoid cases have been among those using the surface water from these pumps.

The driven wells are from twenty to thirty feet deeper than the dug wells; the water has been filtered through a solid gravel layer, and is much purer than in the dug wells. Numerous cases are cited of families where those using hydrant water escaped, while a number preferring the pump water suffered with typhoid; also cases where families changed from hydrant to pump water, and the fever broke out among them.

Dr. Clemens asks if, "bearing in mind the wonderful rapidity with which micro-organisms multiply, would it require any great strain upon our credulity to believe a single glass of germ-laden water capable of producing, in a susceptible subject, a case of typhoid-fever."

There seems to be little doubt among the more intelligent practitioners of Louisville, that the endemic prevalence of typhoid there the last year and in the previous years was due to polluted water, while many of them refer the disease directly to the jointed bacilli recognized by pathologists as the specific germ of typhoid. Dr. Reynolds has found the germs in the water in all cases where he has examined it from "typhoid wells."

GUIDE TO BUYERS AND SELLERS OF REAL ESTATE; HOW TO DRAW A CONTRACT, ETC. By GEORGE W. VAN SICKLEN, Counsellor at Law; *Real Estate Record and Builders' Guide*, New York.

LITTLE FALLS WATER WORKS. Report of Engineer Babcock, Little Falls, N. Y.

THE BROMIDES: THEIR PHYSIOLOGICAL ACTION, THERAPEUTICAL AND TOXIC EFFECTS, ALONE AND IN COMBINATION. By WILLIAM B. HAZARD, M.D. Reprint from *Gaillard's Medical Journal*, New York.

WATER SUPPLY OF CITIES AND VILLAGES. The Anniversary Address before the Medical Society of the State of New York, 1886. By A. VANDER VEER, A.M., M.D., President, Albany, N. Y.

REPORT OF A CASE OF CÆSAREAN OPERATION. By EDWARD JENKS, M.D., Detroit, Mich.

NUTRITIVE VALUE OF SOME BEEF EXTRACTS. An Experimental Inquiry. By THOMAS J. MAYS, M.D. Extract from the Transactions of the College of Physicians of Philadelphia.

THE ORIGINAL JENNERIAN VACCINE VIRUS, AS PRESERVED AND USED IN THE PUBLIC VACCINATIONS IN THE CITY OF PROVIDENCE, R. I. Reprint from the Annual Report of Charles V. Chapin, M.D., Superintendent of Health, with notes by C. H. Leonard, M.D., Providence, R. I.

THE ORIGIN AND OBJECTS OF THE NEW ORLEANS DRAINING AND PAVING ASSOCIATION. Addresses of Edward Fenner, President, J. O. Nixon, Jr., Attorney, New Orleans.

ANÆSTHESIA: WHO MADE AND DEVELOPED THIS GREAT DISCOVERY? A Statement "Delivered upon the Mellowing of Occasion," by G. Q. COTTON. New York: A. G. Sherwood & Co.

THE TREATMENT OF WHITE SWELLING OF THE KNEE. By A. B. JUDSON, M.D. Reprint from the New York *Medical Journal.*

OBITUARY RECORD OF GRADUATES OF AMHERST COLLEGE FOR THE ACADEMICAL YEAR ENDING JUNE 30th, 1886. Amherst.

ETHICS OF FEMALE STERILITY. By A. REEVES JACKSON, M.D. Reprint from the *Physicians' Magazine*, Philadelphia.

HEALTH LAWS OF THE STATE OF IOWA. Iowa State Board of Health, Des Moines.

JAMES OTIS, author of "Toby Tyler," will begin a serial, called "Jenny's Boarding-House," in the February *St. Nicholas*. The boarding-house was kept on business principles, and was the home of thrifty newsboys. The same number contains a story of Iceland by Hjalmar H. Boyesen.

EDWARD ATKINSON, the eminent statistician and political economist, has begun in the *Century* a series of timely papers. One on the Food Question is published in the December number. In the January and February numbers he publishes two articles on "The Relative Strength and Weakness of Nations." They probably contain the most valuable and suggestive study of the material growth of the country yet made by any single writer. Mr. Atkinson will treat in other papers of "Progress from Poverty," "The Margin of Profit," "Henry George's System of Land Taxation," etc.

"ABRAHAM LINCOLN: A History," reaches in the February *Century* a period of important events: the Mexican War following the Annexation of Texas, and the Polk and Taylor Campaigns. Lincoln is shown in his career in Congress (in the campaign for which his entire expenses were seventy-five cents!) and in his law practice and law habits.

THE LAWS OF HABIT, by Professor William James, of Harvard College, in February number of *Popular Science Monthly*, is a very clear explanation, on physiological grounds, of the way in which habits come to involve all the functions of the organism, growing with its growth, and hardening into permanency as it matures, making this article invaluable reading for youth and for those who have the care of the young.

THE POPULAR SCIENCE for March will contain a portrait of its founder, the late Professor E. L. Youmans, engraved on steel by Schlecht. The likeness is considered remarkably vivid, while the execution of the work is much superior to ordinary book-plates.

SCRIBNER'S MAGAZINE for March will contain a vigorous and thoughtful paper from the pen of Professor William James, with the title, "What is an Instinct?" in which he discusses especially the instincts of man, their nature, and the laws which govern them.

PAMPHLETS RECEIVED :

Nineteenth Annual Report of the New York Orthopædic Dispensary and Hospital (for Children with Spine and Hip Diseases), for the year ending September 30th, 1886.

Source of the Mississippi, comprising (I) Letter from Messrs. Ivison, Blakeman, Taylor & Co. (II) Report of Hopewell Clarke, Chief of the I. B. T. & Co. Expedition to the Headwaters of the Mississippi, October, 1886. Ivison, Blakeman, Taylor & Co., New York.

The Medals, Setons, and Tokens Illustrative of Obstetrics and Gynæcology. By Horatio R. Stover, A.M., M.D., Newport, R. I.

Sterility. Management of the Secundines. By Professor William H. Wathen, M.D., Louisville, Ky.

Hydrogen Peroxide. By William B. Clarke, M.D., Indianapolis, Ind.

Care of the Mother and Child in the Lying-in Room. By J. Martin Kershaw, M.D., St. Louis, Mo.

The Exploration, Excavation, and Illumination of the Interior of the Bones in any part of the Body. By Professor Milton J. Roberts, M.D., New York.

Report of the Board of Managers of the Observatory of Yale College, 1885–86.

Report on Classification of Mental Diseases as a Basis of International Statistics of the Insane, made to the Belgian Society of Mental Medicine. By Clark Bell, Esq., New York.

HORSFORD'S ACID PHOSPHATE.—Dr. W. W. Gardner, Springfield, Mass., says : "It seems almost tautological to recommend Horsford's Acid Phosphate as a valuable local and stomach tonic. I have made use of it in my family and in practice for years. I will, however, repeat what my practice confirms, that I value it when taken according to directions as an excellent preventive of indigestion, and a pleasant acidulated drink when properly diluted with water and sweetened."

SCOTT & BOWNE, manufacturing chemists of New York, make a specialty of producing an emulsion of cod liver oil with hypophosphites. Their great care in selecting the oil and in making the combination is amply proven by the high thera-

peutical value set upon the emulsion by the profession. It is no new remedy, but has been steadily growing in demand for a number of years. It is certainly very useful in restoring wasting tissue, and in cases of scrofulous children it acts almost as a specific. They also offer a Buckthorn Cordial which is highly useful in the treatment of constipation.—*Massachusetts Eclectic Medical Journal.*

SPURIOUS BROMIDIA.

RICHMOND, VA., November 9, 1886.

Gentlemen: I have before me two samples of Bromidia, purchased from different drug stores in this city. They are, apparently, so different in appearance, taste, and therapeutic effects, that I want you to write me which one is made by you and which is spurious.

Sample No. 1 is reddish brown in color, slightly opaque, and not very disagreeable to the taste. The dose of one or two drachms have a decided hypnotic effect. Sample No. 2 is of a light greenish brown color, perfectly transparent, and intensely disagreeable to the taste, being bitter and acrid, and bearing evidence of containing no coloring matter whatever. The dose of one or two drachms does not have as decided and prompt an effect as in the case of No. 1.

I write you for information on the subject, as I frequently prescribe Bromidia and am often disappointed in the effect.

Trusting that you will favor me with as early and explicit a reply as possible, I remain,

Very respectfully yours,

CHARLES H. CHALKLEY, M.D.

MESSRS. BATTLE & CO., St. Louis, Mo.

RICHMOND, VA., January 17, 1887.

Gentlemen: Your favor of the 13th inst. is just to hand. The bottle of Bromidia came safely to hand and satisfied me beyond a doubt that the article (sample No. 2) I had been getting in my prescriptions was spurious and totally unlike the genuine, both in physical appearance and in therapeutical effects.

Yours very truly,

CHARLES H. CHALKLEY, M.D.

MESSRS. BATTLE & CO., St. Louis, Mo.

THE SANITARIAN.

MARCH, 1887.

NUMBER 208.

FOURTH ANNUAL MEETING OF THE OHIO STATE SANITARY ASSOCIATION.

COLUMBUS, O., FEBRUARY 10–11, 1887.

THE Association assembled in the committee-room of the Neil House, and was called to order by the President, Dr. H. J. Herrick, of Cleveland, at 10 A.M., February 10th. The minutes of the previous meeting were read and adopted. After which the usual reports of standing committees were heard and acted upon.

In the absence of the treasurer, Dr. L. C. Herrick, of Columbus, was elected treasurer *pro tem.* The following committee was appointed on nominations: Drs. A. H. Brundage, Xenia; C. E. Beardsley, Ottawa; John McCurdy, Youngstown; S. H. Smith, Warren. Next followed the reading and discussion of papers, as follows:

THE REAL AND THE IDEAL IN HYGIENE.

Annual Address by the President, H. J. HERRICK, A.M., M.D., Professor of State Medicine and Hygiene, Western Reserve University, Cleveland.

To say that the physician must know anatomy would be a truism. To say that he should also know physiology would be equally axiomatic. But that he should know the conditions under which the normal physiological functions are performed does not meet with such ready assent.

To elucidate these facts is the object of this paper.

A long-neglected obligation rests upon the physician of to-day, that he should, in the spirit of the true philanthropist, hold up the danger signals over all agencies of disease ; prescribe fresh air for the pallid cheek, nutritious food for the emaciated, exercise for the flabby muscle, and clothing that will protect and not burden the wearer.

Everything exists in its present condition according to law. If the true type exists it has conformed to the law of its being ; if defective, then some conditions are wanting. All animate matter, as well as that which is inanimate, exists under certain natural conditions. All matter exists in perfection when it conforms to perfection of type. This is equally true of inanimate matter, and of the lowest as well as the highest order of organic beings.

For example, the crystal reaches its perfection in uniform surfaces and angles according to a law which controls the particles of matter as they arrange themselves in the beautiful gem. If the conditions are favorable its structure is perfect. Plant life, in all its varied species and varieties, is in accordance with conditions which culminate in the fixation of type. Hence it becomes the agriculturist to examine with care the conditions under which his crop may be brought to the highest type. The same is true of all plant life and products. There are conditions of soil and climate by which the most luxurious growth, the most delicate tints, and the choicest flavors may be secured in different varieties. It alike becomes the horticulturist and the floriculturist, as the agriculturist, to study the conditions of healthy life and growth, if he would meet the demands of his calling.

It is equally true of animal life, from the lowest to the highest order of beings ; the simplest germ and the highest type of organic bodies, the human species, are alike under the sway of conditions of life and growth, for weal or for woe—promotive of life and health, or of disease and death.

In the processes of evolution which are ceaselessly going on in nature we see the manifestation of that law by which everything would reach its ideal type. In this conception I am impressed with the recognition of an all-wise and infinite Creator, who laid the foundations of the universe and established the laws and conditions by which the ideal should become real.

To my mind Darwinism, and the teachings of progressive development, does not dispel the recognition of an intelligent first cause who established the laws of the universe and all organic life.

It is in harmony with our topic, as we extend our observation beyond the realm of the forces that move and control inanimate matter, and contemplate those upon which instinct and reason depend, to come to the special subject of our present consideration—the promotion of health. With a clear comprehension of the results predicated upon recognized natural laws, we should be able to choose our own course in life, conscious that on our choice depends our physical condition, health, or disease ; in the one case bringing along in its train such results as shall give a radiance of joy, and in the other bitter pangs of remorse and sorrow together with the pains of sickness and premature death.

If I am able thus to impress the mind with the thought that each of us has a real self as well as an ideal one, that all have powers more or less developed, by which every one is made responsible to himself alone for the results of natural laws, then I shall have accomplished my purpose in these reflections.

We may thus be able to appreciate the conclusion that there are conditions under which every person may attain to the most perfect development, and that by finding out, and conforming to those conditions which promote health, we gain for ourselves and for society the greatest good. Hygiene seeks to accomplish this. It enlists the individuals under the motive of self-love. It enlists the co-operation of State authority to secure the blessings of life, liberty, and the pursuit of happiness for all.

Conformity to the laws of our being, then, is the great problem. In that there is not, and cannot be, any conflict.

Physiological law has no conflict with civil or moral law. Hence our inquiries enlist the most absorbing attention of the individual in his own behalf, and in that of the community as well. The chemist, if he would know the chemical changes must know the atoms of bodies, their affinities, electrical states, etc. The histologist must know the character and properties of the cell if he would know the different tissues and organs

of the body, and be able to trace in them the beginning of disease processes.

So the sanitarian must inquire as to the individual member—the unit of the community—and learn his peculiarities, controlling influences, and habits of life. He must have in mind the conditions for the attainment of the ideal type. It may also be observed that each tissue has its typical form and structure, whether it be bone, muscle, nerve, or other tissue.

In the repair of injured tissue or recovery from disease the type is to be restored and maintained.

The important questions for us to answer as individuals, physicians or sanitarians, are, How can we attain to that ideal type? How develop all the powers within ourselves and attain to that stature designed for us, meet the full object and end of life, the highest degree of enjoyment? By conformity to the law of our being is the only answer.

When we consider the wastes of our physical energy, even with the most prudent and the most successful, we are unable to conceive of what might have been attained without such profligacy of our endowments. Wasted powers, wasted opportunities, when fully comprehended can only bring remorse. If we inquire into the sources of our highest enjoyments we find they do not consist in the gratification of our appetites and passions, do not consist in the unconscious state of sleep but in the healthful and normal activity of our powers, physical and mental; in the accomplishment of some chosen purpose.

Suppose you were presented with, and intrusted to care for a certain delicate machine adapted to certain vitally important work to yourself, and that upon its right use your enjoyment and success in life depended, how scrupulously would you guard and care for it; how anxiously seek to adjust its use to its greatest capacity; how carefully seek the conditions to which it was adapted, and avoid all those experiments and alluring inducements to controvert its powers. If it had a capacity dependent upon certain conditions, how you would seek to learn those conditions that you might have the benefit of its utmost effects. And if its full power could be had only by use, how vigilantly you would exercise it, and watch the increase of power thereby.

A steam locomotive fresh from the maker, with all of its parts

perfect, is, barring accidents, equal to a life capacity of about 400,000 miles, when, by a little remodelling, renewing wheels, reboring cylinder, repacking, replacing weakened parts, etc., it may be given a new lease of life-work for 150,000 to 200, 000 miles more, then its destiny is the scrap pile. It has accomplished its life-work, accomplished its mission, and given honor and glory to its builder. The care of the inanimate object is a practical lesson in the care of the human machine and its powers and capabilities. By its application one should be able to appreciate the importance of understanding the conditions of life, and individual responsibility for its maintenance in conflict with all the conditions with which it is surrounded, and realize the twofold mission of the physician of to-day, as being no less concerned with preventing disease than curing it. He is, if he exercises his full mission, not only a leader in the ways of health but a guide to the paths which may, for the time being, have been lost.

This is the new era of the medical profession. Already we see its gleam in the new impulse given to the great problems of sanitary science.

The physician who ignores the opportunity in this direction not only fails in doing justice to his patient but fails in his most fruitful field for professional success.

These propositions are not new. They are the outcome of the accumulated observations of ages, and verified by the intense science-light of this nineteenth century.

They were in part promulgated among the people over three thousand years ago, as: "Thus saith the Lord," "Thou shalt," and "Thou shalt not," observed with religious fidelity. To-day those commands are verified in the experience of individuals and nations.

Sanitary science is woven into the life history of every nation and enters largely into the history of civilization everywhere. In the history of nations at certain great periods a divinely appointed oracle appears who sums up the concurrent conclusions of the age, which conclusions become established laws. Thus the Mosaic Code of the Jewish race receives the approval of all time, and is accepted by all civilized nations of the earth. By it we can account for the greater longevity of the Jews than of other people in all ages. The strength of

mind and character which they possessed in primitive times, and the silent influence of certain of their customs in the promotion of health and longevity were never so apparent as they are to-day.

The grand old Greek laws were but an outgrowth of the code propounded by Lycurgus, which became the sanitary laws of Athens and the little Greek republic born before its time. Yet the Greek knew little or nothing of the causes of disease as they affected the people.

The Greeks interpreted the terrible epidemics which prevailed as manifestations of offended deities. Their downfall as a nation was due to their low morality and lawless excesses notwithstanding their laws. The Greek laws were made with the idea that men were made for the government rather than the government for men.

We may now see moving among the minds of men the policy to put each individual under obligation to himself and his God, and along with this obligation to give the largest possible liberty to every one, so long as he does not interfere with the rights of his neighbor. This is the great privilege of to-day. Every man is put upon his own behavior. If he chooses to squander his opportunities he may do so. The race is free and equal in opportunity but not in equipment. I am only to use what I have.

Again, this accepted principle of individual liberty imposes upon each one the obligation to provide for his own needs, and not to impose this obligation as a burden upon others. But here comes in another principle growing out of the obligations to each other and to society. It is involved in the principle of love to one's neighbor as formulated under the higher law of love to God and man. Upon this rests the moral obligation as sanitarians to hold up the laws of our own well-being. An obligation to teach the people that good conduct, personal cleanliness, and the avoidance of all excesses are cardinal principles for the preservation of health. That physical and mental, as well as moral training, must go hand in hand. "*Mens sana in corpore sano,*" should be the motto of all who look wisely to the well-being of mankind. Empty creeds may serve to blind the eyes of the ignorant, but if the community would be well ordered it should look to the

individual responsibility. Health boards are corrective, not instructive. They may act arbitrarily and harshly, arresting and punishing the ignorant, hence—those who are not willfully so—innocent victims. There is need, therefore, of instructing the people. There should be sanitary lectures for adults, and text-books on the principles of sanitary science should be introduced in our schools. Advances which I am glad to know are appreciated and practised to some extent, and worthy of our hearty support.

Our churches, too, have need to be admonished of neglected obligations to the physical well-being, as well as spiritual, of their cure. In short, the whole people need awakening to the wealth of public health in its every field of view.

Indeed, I believe that a school of hygiene for the education of the people of all classes in sanitary subjects would not only work great things for the health of the individual, and be for the political and moral well-being of the community, but be pecuniarily profitable to him who will undertake it. Nothing can better illustrate the need of such instruction than the avidity with which persons who have acquired a little knowledge of the results seek their application.

I think no one can fail to observe this interest in sanitation in the minds of the masses of to-day.

The laws of sanitary science are as much God's laws as the accepted code given to Moses on Mount Sinai. The scope of hygiene, then, is to point out those conditions which exist for the growth, development and health of the individual. It does not forget to guard, as far as may be, the transmission of hereditary diseases from one generation to another. It should have in view, also, those laws which regulate the individual in his social relations in communities which are included under the term State medicine. Such a scheme presents the division of personal and public hygiene.

Under the head of personal hygiene the individual should be considered in his dual relations: the relations of the sexes, marriage, parentage, heredity, home, and the rearing of a family. State medicine should comprehend the policy of government regarding the public necessities—food and water supplies, sewerage, dwellings, occupations, etc. These suggestions indicate in a general way the questions that must be

considered in attempting to secure the conditions under which practical sanitation on a large scale may be most successfully conducted.

Hygiene considers diseases under the two heads—avoidable and unavoidable. It proposes to indicate the means of preventing the avoidable. In this we may not overlook the practical fact that the causes of disease are being investigated with more vigor and under more enlightened processes than at any previous time. Practical medicine, also, has made great strides in recent times. The judicious physician to-day does not attempt to cure disease in the ancient sense. He recognizes nature as the healer, and his province as that of an assistant, to remove the cause and furnish conditions that are favorable for the restoration.

When all avoidable diseases are averted, and the favorable conditions furnished for a complete development and use of all the powers of the ideal type of mankind, we may conceive of human life lengthened to a hundred years and more, to that of our patriarchal ancestors; and conceive of men and women of great stature, fully developed in all their physical and mental powers, veritable giants in both body and mind, such as we read of as having lived in ancient days, and then passing away without pain or sorrow, having completed an existence which was real, that conformed to the ideal.

SCHOOL SANITATION.

By LeRoy D. Brown, Ph.D., State School Commissioner, Columbus, O.

One man, one report of a committee and one newspaper, should be mentioned in this connection: D. F. Lincoln, M.D., of Boston, Mass., the writer of the Lomb Prize Essay on "The Sanitary Conditions and Necessities of School-Houses and School Life," recently published by The American Public Health Association; the report of a committee appointed by Congress in 1882, to examine the public schools of the District of Columbia; *The Sanitary Engineer*, published weekly in New York.

It is not intended to quote extensively from authorities, or to give arguments in detail. The statement of facts and

principles in compact form is deemed sufficient for the purpose. I have adopted Dr. Lincoln's division of the subject, which is : (1) *Site of the School-house ;* (2) *Plan and Arrangement of the Building ;* (3) *Ventilation and Heating ;* (4) *Sewerage ;* (5) *Hygiene of the Eye ;* (6) *School Desks and Gymnastics ;* (7) *Affections of the Nervous System ;* (8) *Contagious Disease ;* (9) *Sanitary Supervision.*

Site.—In selecting a site for a school building, dampness, malaria, noises, and nuisances should not be overlooked, and an abundant supply of direct sunlight should be secured.

Plan and Arrangement.—Reformations in school architecture do not keep pace with reformations in the architecture of dwellings. Nevertheless, each succeeding year finds a great or general interest in the subject, and a knowledge of school hygiene is everywhere regarded as a part of the necessary equipment of teachers and school officers. School-rooms should be neither too large nor too small. Large rooms are not easily lighted, and small rooms are difficult to ventilate. Spiral staircases are dangerous in case of fire alarms. Three story buildings injure the health of girls who are required to climb to the highest rooms, and meagre playgrounds restrain the freedom of children to whom recreation is a necessity.

Ventilation and Heating.—In ventilating and heating a school-room, it is often forgotten that pure air of proper temperature is as essential to the comfort and health of children as wholesome food. To ventilate, or to heat a school-room is not a difficult problem, but to do both at the same time is seldom successfully done. If it were possible I would ventilate and heat every school-room in the land by open fireplaces. This being out of the question, I would recommend ventilating and heating apparatus for school-rooms which would introduce a large volume of pure and moderately warmed air, and carry off a proportionate amount of impure and cooled air, always avoiding the superheated and unhealthful air from hot pipes, which give no opportunity for the escape of air which has been breathed again and again, unless draughty windows be raised or lowered. Where furnaces and similar modern appliances for ventilating and heating school-rooms are employed excellent and satisfactory results have been obtained by observing the following rules :

(1) Provide ample ducts and suitable flues for the introduction into each room of at least fifteen hundred cubic feet of pure air per hour for each occupant ; (2) provide for the carrying off of a corresponding amount of air which has been breathed and cooled ; (3) provide a sufficient radiating surface to warm the pure air without superheating it ; (4) provide that the inlets for the warm air and the exits for the cooled air shall never be closed ; (5) provide that the teacher or janitor may regulate the temperature of the pure air without decreasing its volume.

Sewerage.—There is death in the sewer and danger in the latrine. To these sources diseases in schools are directly traceable. They promote dysentery, typhoid-fever, scarlatina, and diphtheria. Contaminated wells, bad drains, and foul stenches should not be allowed to exist near schoolhouses. In all cases janitors of sufficient intelligence to use water, soap, chloride of lime, and corrosive sublimate in drains and latrines should be employed. Boards of education should not require teachers, and especially young and inexperienced persons, to attend to the responsible duties of janitors. If they do the work will be neglected.

Hygiene of the Eye.—Near sight is increasing in all parts of the civilized world. So affirms Dr. Cohn, of Breslau, who examined 12,000 cases, Drs. Derby and Loring, of New York, who examined 2265 cases, and Professor Anderson N. Ellis, A.M., M.D., of Cincinnati, who examined 1797 cases in the schools of Hamilton and Oxford, O. Defective or abnormal eyesight is a deformity which the schools should guard against as far as possible. It is a detriment to success not to have good eyes, and glasses are inconvenient for many purposes. Yet we are told by those whose authority is unquestionable that those countries whose schools are the best, contain the greatest percentage of myopic people. I myself have seen a school in Saxony in which thirty-seven out of forty-eight pupils wore glasses on account of myopia. With due allowance for such causes as inherited tendency, hardship, and poor fare, I am inclined to believe with Dr. Ellis, that defective light, poorly warmed and poorly ventilated school-rooms, and lack of life outdoors are altogether the leading causes of near-sight among children in school.

Dr. Lincoln's rules for using the eyes are as follows: In school work we should require (1) A comfortable temperature, and especially let the feet be kept warm and dry; (2) good ventilation; (3) loose clothing; (4) erect posture; (5) little study before breakfast, or directly after a hearty meal; none at all in twilight or late at night; (6) great caution about study after recovery from fevers; (7) light abundant, but not dazzling; (8) sun not shining on the desk, or on objects in front of the pupil; (9) light coming from the left hand or left and rear; under some circumstances from in front. (No light from the right of the pupil permitted); (10) the book held at right angles to the line of light, or nearly so; (11) frequent rest by looking up; (12) distance of book from eye about fifteen inches.

There is, perhaps, not a citizen of Ohio who will not find one or more of the above rules violated in the schools attended by his own children. I scarcely have knowledge of a single country school-house that has windows in the rear, the custom being to place the windows in both the sides.

School Desks and Gymnastics.—Great improvement has been made within the last ten years in school desks, but in country schools little children are too frequently obliged to occupy desks that keep the feet dangling above the floor. The feet should always have support, and the desks should be so constructed as to be adapted to the body. The evils of poor seats may be remedied by school gymnastics and abundant exercise on the playground. Gymnastic training in the school-room requires teachers who have been well prepared for such work, but the playground under wise supervision can be made a place of pleasure to the pupils and a means of symmetrical physical development to them.

Affections of the Nervous System.—Overwork, cramming for examinations, and competition for prizes, while almost inseparable from school life, are, nevertheless, evils. Social dissipation, extra lessons, and, among boys, the use of tobacco do great harm to the schools. Overwork is largely due to turgid courses of study, weak supervision, and bad teaching. Cramming for examinations may be charged to the same account. Social dissipation and extra lessons may be attributed in part to the unwisdom of parents and in part to the lack of school-

training in morals and manners. The evils named are not all confined to pupils. Teachers are too often overworked with the task of examining manuscript after school hours. Such practices should be prevented as far as possible by boards of education and school superintendents. If necessary, fewer examinations should be required, and all examination work should be done during school hours. Nimble and vigorous intellects do not often dwell in weary brains, and nimble and vigorous intellects are essential to good teaching.

Contagious Diseases in Schools.—A short time ago an intelligent citizen informed me that he did not expect to send any of his children to public schools. One of the reasons assigned for this was the prevalence of contagious diseases in those schools. His argument was that those who send their children to school will, in many cases, take no precautions for preventing the spread of diphtheria, scarlet-fever, measles, and small-pox until compelled to do so, and that public sentiment is not sufficiently strong to enforce the laws on this subject. There is confessedly a difficulty here which is not likely to diminish as population becomes more dense, but the friends of public schools must exert themselves to educate the people in school sanitation in order to prepare them for the general enforcement of wise laws which will exclude from the schools all who have been exposed to a contagious disease.

Sanitary Supervision.—Thorough sanitary supervision is impossible without the thorough training of school officers, school patrons, superintendents, and teachers in school sanitation. The laws of health should be taught in all homes and in all public schools. All teachers and school superintendents should be required to pass an examination that would include at least the elements of anatomy and physiology. Boards of education in Ohio have legal authority to employ an instructor in hygiene whose duty it should be to lecture when necessary to the teachers and to the pupils in the higher classes, and to act as medical supervisor of all the schools.* The cities of Elmira and Boston each have such an officer. In Brussels, a city of 183,000 inhabitants, and thirty-three public schools, there is a staff of medical visitors sufficient in

* Section 4017 of the Revised Statutes—"Other employés."

number to make a weekly visit, and to give personal attention to each pupil, and medical attention to all pupils whose parents are unable to pay physicians' fees. Such sanitary supervision as Belgium's capital gives her children is needed in Ohio and needed greatly.

Before the final adoption of plans for school buildings a competent architect and competent engineer should be employed. By this I mean one who has mastered both the science and art of architecture, and one who has thoroughly studied the science and the art of heating and ventilating school buildings. These are altogether different persons from those who are mere "local agents," and whose knowledge of their occupation has been derived from the printed circulars of the manufacturers whose wares they sell. We may venture sometimes to employ a poor lawyer, relying upon justice to give us what we deserve. We may sometimes employ an inexperienced physician, trusting the result to nature and a good constitution. But we can never safely employ an unprofessional architect or an unprofessional engineer when we build school-houses for our children. Good architects and good engineers receive good pay for their services, but the increased cost is always more than counterbalanced by the improved health and the increased comfort of those whose young lives are largely spent in the school-rooms.

SYPHILIS, FROM A SANITARY STANDPOINT.

By C. E. Beardsley, M.D., Ottawa, O.

Jupiter is represented in the oldest mythology as having done a thing on Olympus which should entitle him to recognition in a sanitary congress like this.

It was a law of Olympus that Jupiter should not hurl his thunderbolts at men unless in the presence of the other gods, and with the consent of the Involuti (the veiled gods).

It is said he awoke one day from a nap on Olympus and saw a man at the foot of the mountain in sexual congress with a sow. Not a god was within call; even the Involuti were off on a stroll. Here was an emergency: Jupiter seized the hot-

test bolt in the armory of Olympus, wrote on it σῦς φιλος—*syphilis*, and threw it at the unnatural wretch ; it struck and stuck, and the gods said to the end of time the disease which shall spread among mortals from that act shall be called *syphilis*. When the other gods came home Jupiter called them together and made a statement. The case, he said, demanded immediate action, and he had assumed the responsibility. The gods gave him a vote of thanks.

Though this may never have happened on Olympus, the myth is, notwithstanding, instructive. It shows us that syphilis was known in pre-Homeric times, and that it was held in such loathing as to warrant immediate punishment, before a red tape council of the gods could be convened.

Syphilis was not the special scourge of Greece or any other member of the Aryan nation. It was rather a Semitic vice ; belonged rather to the desert than the mountains, and was not the product of unnatural sexual contact with swine, but of an unnatural and excessive contact of man with woman.

The language of the Semitics has no word representing uncle, therefore he was not recognized in such a relation by this desert people. Their language implies a condition of society, antedating the patriarchs, in which any number of brothers held one wife in common.

Syphilis is the scourge of polyandry. Further, circumcision was instituted very early in history by this people, perhaps, at first, as an offering of foreskins to appease an angry God in atonement for transgressed natural laws. It was often observed by the high priests, the physicians and sanitarians of those days, to be the part most frequently attacked with disease. Again, David in his Psalms, appears to have had a personal knowledge of this disease ; that he left an infected offspring, there is but little doubt, which ended in the *lineal* reign of his grandson Jeroboam.

Volumes have been written to lay the origin of syphilis in Europe, at the door of America, and her poor, ignorant, but virtuous Indian women, and that it came through the discoverer of America and his crew. But Columbus first landed on a border island in 1492. In 1495, three years later, the whole French army, led by Charles VIII., were said to be infected with syphilis ; also the defenders of the kingdom of Italy. And almost simultaneously all Europe was groaning with it.

It does not appear from this evidence, that so small a "lump" of *this* "leaven" from America, could infect the whole of Europe in three years. That virtue was known and practised between the years 1492 and 1495 is a well-established fact in history, which leads us to believe that syphilis was among men long before the discovery of America. It matters not so much to us where, when, or among which people syphilis first appeared, as it does what we are to do with it as we find it among us.

Syphilis, like many of the contagious diseases, is known only by its effects, the study of which has been principally confined to the present century.

What our ancient Semitics knew of this disease, as being communicable from one individual to another, does not clearly appear. We have to look for information to a later period; perhaps as late as 1495, when all Europe was a fester-bed. And we are led to believe, from our study of the writings of Hirsch, of Germany, and Bassereau, of France, that earlier writers on syphilis were capable of differentiating accurately the various venereal affections; but later, the immortal John Hunter became confused in his observations, affirming the identity of gonorrhœa and syphilis, a doctrine which obtained such a strong hold upon the profession because of the profundity of the eminent author, that it was subscribed to for three fourths of a century but is now wholly discarded.

It is not my province to quote to you what is taught by a majority of the most advanced and distinguished syphlographers as to what distinguishes the different varieties of venereal disease. Mine is another field. Observing from an historical standpoint syphilis has long been, and is likely to be forever among us in some of its forms, and I am not sure if our own immortal S. D. Gross, as a scholar, student, and physician was not justified in the utterance, that a syphilitic's ghost would have syphilis. Be that as it may, I have no coals of fire to heap upon the head of any unfortunate being, but prefer, rather, to stand as a sentinel of danger, pointing to a safer road and a brighter hope.

There was a time when our country, sparsely settled, with here and there a neat village dotting a beautiful landscape, was almost free from acquired syphilis, but in these days of rapid transit it is quite different. To-day it must be a very

small village indeed which has not at least one house of assignation. Such houses were once confined to large cities, but now country homes are invaded and made breeding places of venereal diseases. There is not a physician of ten years' practice who cannot count a score of infants, born apparently healthy, who are in a few weeks covered with an erythema of a coppery-red color, others with a sallow, wrinkled appearance of decrepit old age. Such cases, when once observed and studied, are not easily forgotten. The mucous membranes do not escape. Syphilitic patches are seen in the mouth and elsewhere ; the bones are affected ; even the teeth, as pointed out by Jonathan Hutchison, mark the syphilitic child ; nothing, indeed, seems to escape the clutches of this monster. I do not think it an overestimate to say there are over half a million of men and women in the United States who are syphilitic. If we take the reports of charitable institutions in large cities, observing the number of this class of patients who receive treatment, as a guide, we will be able to make an approximate estimate of its vastness. Out of every 55 (round numbers), charity patients in New York, one is syphilitic. Of those treated in London charitable institutions one in 28 is syphilitic. These figures only represent the poorer classes, whose circumstances force them on charity and thus into statistics.

The French records show one syphilitic to every 40 of the population of Paris. Reports of the Surgeon-General United States Navy, show one in 50 of the applicants for enlistment of lads under seventeen years of age, tainted with venereal diseases. True, those enlistments are not usually from the better class, which, taken into account, makes our statistics less appalling. The sickening odors which emanate from the blotched, scabbed, palsied, rickety, curved, blind and lame which we meet at every turn speak volumes ; they point to loathsome diseases, many of which are the effects of syphilis.

Yet thousands of those wretched beings are not responsible for this condition in life any more than they are for their existence. Children have no election in the matter of birth, nor as to who shall father or mother them and stamp a diathesis which will never fade. Neither is a parent at all times responsible ; their ignorance may be the cause of much suffering.

The communicability of syphilis is through many channels, if we are to believe our own observations, and the opinions of the foremost thinkers and writers of this age. Therefore, the virtuous, the young, middle and old-aged, often become victims of syphilis through no fault of their own. It is a disease which can be communicated from a lover's lips ; from the lips of an infant to its nurse ; from the nurse to the infant ; from cigars ; from pipes ; from clothing ; from paper money ; from canes and gloves ; from anything and everything capable of retaining the virus sufficiently active, until it comes in contact with its victim. To enumerate all the known channels of infecting would be as useless as tedious, but the public should be made to understand its subtleness, that pure men, women, and children may not be contaminated by this insidious monster. A few years ago an aged physician, whose character was above reproach, came under my observation. He was suffering from an attack of syphilis which was contracted through an abraded finger while in the exercise of his professional duties as an accoucheur. In a short time his whole person became covered with syphilitic erythema. He became despondent and emaciated ; mucous patches appeared on the tongue ; iritis supervened, and he became totally blind, notwithstanding the most skilful treatment.

The party from whom the disease was contracted was not aware of the poison lurking in her body, contracted from a worthless husband. However, I subsequently treated this woman for constitutional syphilis, she having syphilitic iritis ; for months she was almost totally blind. The child, now deaf, and almost blind, is an inmate of the deaf and dumb asylum located in this city. Cases of similar history are familiar to all experienced physicians. So intimately interwoven with syphilitics has society become that the pure are continually jostled on every thoroughfare, be it a horse or steam-car ; public or private parlor ; at home or abroad.

Doctors no longer find it necessary to visit large cities to study the symptoms and pathology of syphilis. Unfortunately its symptoms may be found among their patrons in every hamlet. In these days of rapid transit, greater facilities of intercourse of one people with another, which are prolific sources of spreading contagious diseases, it would be strange

indeed, untrammelled as syphilis is, not to find its encroachment upon society.

If we were to assert that syphilis did exist in pre-Homeric times, it would lead to the belief that it is less contagious than small-pox or cholera (which we don't believe), and may be accounted for, in potency to spread, by assuming that its special route of infection was and is through sexual congress. That the more virtuous were a people the longer were they exempt from syphilis, is well known ; a fact pointing to a special route of travel, and *the* mode of propagation.

Perhaps no greater calamity can befall us as a nation than the unlimited emigration to our shores of a low and morally degraded people, who are ever ready to fall into every vice which presents itself, and, if not diseased when they land (I am sorry to believe many are), they soon become victims of the vicious, and are thus a new source—a mother to breathe her pestilential breath upon others. This cannot be successfully denied. Fifty-two per cent of the criminals of New York State are of foreign birth ; nearly one third are Irish, and one tenth Germans. (See *Medical Record*, January 8th, 1887.)

If our foreign-born are so prolific of crime, punishable by statutory law, is it but just to assume that they are equally as prolific of disease, especially the one now under consideration ? Through some of the many channels, perhaps by the fondling kiss of some affectionate woman (God bless the women, but they have their faults, and this kissing every baby they chance to meet, is not only abominable but dangerous), an innocent child may be contaminated, who, in after years may seek the hand of an only son or daughter of yours, my brother, and they, by the law of procreation, bring into the world children deformed in body and mind, a burden to their parents and a curse to society. At whose door lies the blame? Such cases are more frequent than beautiful to contemplate. Search the records of our hospitals, asylums, county poor-houses, and you will find a large per cent of the inmates to be of foreign birth and syphilitic. All physicians are aware that many of the incurable insane are victims of syphilis. However, by a report of Dr. C. W. King, Superintendent of the Dayton Asylum, made to Governor Hoadly for 1885, of those admitted during the year there were 152 native born, 29 foreign born, and two unknown. Omitting the unknown

over nineteen per cent are of foreign birth. How many there may be in the native born list who are of foreign parentage, either of the first or second generation, the record fails to show ; but, if shown, would be valuable to the statistician and sanitarian. As to the causes of insanity the record is imperfect, as stated by the doctor to me in answer to inquiries. In the doctor's reply he states that of the 586 in the house, probably twelve are complicated with syphilis. Knowing how difficult it is to diagnose syphilitic complications in the insane, *as cause*, I am led to believe that the doctor has not over-estimated the percentum.

From what source, let us inquire, are all the charitable institutions filled to repletion? Mostly from the back streets, tenement-houses, the places where are found the hotbeds of prostitution, and its accompaniment, syphilis, as well as the immigrant. The evils of this pauper immigration are not only seen in syphilis but in almost every walk of life. It has become a dangerous element in politics, in labor, in life and property. If they were of utility to their maternal homes, would not an embargo be laid preventing such vast depletion of her people? But, as it is, any government is far better without this element.

In discussing the immigrant from a political standpoint I believe I am only reflecting that which will prove to be a vast field of work for the sanitarian as well as the politician.

The most difficult part of the problem is, How are we to avoid a further contamination by the spread of syphilis, and to rid ourselves of that which now exists among us?

The licensing of prostitution has been advocated by some of our best men, morally ; by others, to stamp it out by statutory law and penal codes ; but it, like the liquor question and Banquo's ghost, will not down. France tried the first (to license prostitution), and Paris, her great city, is now a fester-bed of syphilitics, "one to 40 of her entire population."

("Fournier asked 873 male syphilitics how they became infected. It was found that 625 got the disease from registered, licensed, and regularly examined prostitutes, 100 from workingwomen, 24 from domestics, 24 from married women, 46 from clandestine prostitutes. The inquiry shows that the licensed prostitutes was the most serious source of infection." See *Medical Record*, February 5th, 1887.)

There seems to be no statutory law equal to the task. Registration, licensing, and penal codes are all alike dead letters ; neither can be enforced by a people where such registration and penal codes will conflict with their moneyed interests. Here in America, and elsewhere, health is a secondary consideration to wealth. Men and nations not only wink at, but ignore, those pestilential foes which do not come upon them with drum and fife and roar of the cannon, but far more destructive.

If we cannot look to our public men for remedy, theologians for moral suasion, law-givers and their executioners for redress of such grievances, other channels must be sought. Law and moral suasion have failed us. To the medical profession we now turn. *Suggestively*, you will allow me to call your attention to a remedy :

Remove the odium of the old Hippocratic oath of secrecy from the physician in cases of syphilis as you would in cases of small-pox or yellow-fever. If not to hang out to public gaze a danger signal, make it obligatory on him to register all cases coming under his care in a public record, as deeds and mortgages are registered, that those interested may refer to for information. If such a registration were compulsory on all practitioners of medicine, it seems to me it would in time wipe out syphilis at home, and by preventing its importation from abroad by a strict quarantine, it would only be known here by name. This ever brings before us the immense throng of pauper immigrants. They are not only contaminating by diseases, but morally and socially are a great evil. No man in America will extend the hand of friendship to the worthy immigrant to our shores, and bid welcome and God-speed more heartily than he who now addresses you, but they need vigorous culling to become clean and useful citizens. To do this, allow me to again suggest that this sorting out of the worthy from the unworthy can be better accomplished at the port of departure than at the port of arrival. To accomplish this have every immigrant, old or young, pass a scrutinizing inspection before setting sail for America, and by AMERICAN PHYSICIANS. If found worthy physically, morally, and intellectually, give them a passport and we will welcome them.

Self-preservation is the first law of nature, individually or nationally.

DIAGNOSTIC RESPONSIBILITY.

By H. M. Lash, M.D., Athens, O.

Correct diagnosis cannot be too highly estimated. Upon it all proper procedures and accurate conclusions rely. It forms the guide to the physician's understanding of what *is* and to his calculation of what *will be*. Without it there is darkness and confusion; with it there is clearness and certainty, hence its importance; and no physician can afford in these days to be deficient in this direction. To him who finds himself crippled in this quality, there is sure to come, sooner or later, more or less of failure and disaster.

Mistakes may occur; that they do occur is not deniable. Men may err; it is but human for them to do so, but they may honestly err, and that, too, with a judgment trained and sharpened by rigid experience, and aided by all known instruments of precision. To a large extent, under such circumstances, men are excusable; but even then the breadth and the extent of the excuse is measured either by the harm done or the good *not* done.

On the physician's account, as kept by the public, there are charges for both incompetency and misdoings. The people are generally more ready to enter on the account these charges than they are to credit him with his duly-earned achievements. Who is to blame? The object of this paper is not a discussion of a question as broad as that, but of only one branch of it, namely, that one wherein the physician is directly and inexcusably at fault. Are there such cases? Yes, many of them, and no field in the domain of that grand department—preventive medicine—is to-day broader or more inviting to the worker than is the one of diagnostic errors.

Ordinary mistakes—such as result in no deleterious or fatal consequences—can be, to a reasonable degree, tolerated. But when errors result in widespread epidemics which demoralize whole neighborhoods, causing death, broken-up homes, and disfigured bodies, then toleration ceases to have even the semblance of a virtue.

The following reported history of a sad experience of this kind, all the facts of which are personally known to the writer, is here introduced for illustration. In October, 1881, there came into the eastern part of Athens County from Pittsburg a family having among its members two small boys. These two boys in a few days were taken ill, and a young physician, living in a neighboring town, and a graduate of a Columbus medical college, was summoned. He pronounced the cases small-pox. The family and immediate neighbors were not satisfied with this opinion, because the physician was a young man, and to be a young man, especially a young physician, is still, in some parts of this country, considered to be almost a crime. Accordingly, an older physician, one whose head was already becoming frosted with many winters of professional toil, was called.

He, in his experienced wisdom, and to show the inability of his young competitor to make a diagnosis, pronounced the cases *not* small-pox. He went further, and jeeringly called the trouble "Dr. B's itch." Here was a disagreement. The young doctor was pushed aside and the older one employed. The family and friends, and neighbors, under his diagnosis, had free access to the sick-room and time went on. Not much, however, had elapsed before others became ill, and then a dark cloud of apprehension settled over that community; there was in their midst a serious, contagious, and fatal disease. It spread, and kept on spreading, until sixty-three cases of genuine small-pox occurred. Of this number thirteen died, five adults and eight children. Of those who lived about one dozen are sadly disfigured for life.

In this example of mistaken diagnosis lies the key-note of this essay. Closely associated with the statement of the facts connected with it is the thought of the responsibility for the epidemic. That it rested on the error of the physician making the incorrect diagnosis is not questioned. He afterward acknowledged it himself, and proceeded to move from that neighborhood to a distant Western locality, while the young physician rapidly gained both in favor and in practice. The community breathes better the atmosphere of physical safety since the old doctor left it. For years he had been a faithful practitioner among them, holding strongly their confidence,

and largely enjoying the fruits of their patronage. They looked upon him as a friend and a safe counsellor ; but in this instance the results proved him to be, if not an enemy, at least an unreliable medical adviser, and with this their confidence faded away. To him, this alone was probably a sufficient punishment.

These particulars having been disposed of, we are now left to a general consideration of the effect and responsibility of such errors. Such mistakes are not common, but they are often made, and, when they *are* made, what are the immediate consequences ?

First, such diseases as are contagious are allowed to spread and produce all their dire effects.

Secondly, confidence in medical men is weakened, and one such instance is likely to reach to, and include, to a certain extent, the whole medical profession.

This latter proposition will meet with an affirmative indorsement from all the intelligent of our ranks, whose misfortune it is to compete with men whose calibre admits of such blunders. They are belittled by them, and often made to feel keenly the sting of humiliation. The first proposition proves itself. There is little doubt but many other cases might be cited equally as conclusive as the one herein related. They may be found in nearly every community in this whole country. The State of Ohio is by no means free from medical ignorance. It is true the standard has been raised ; and it needs to go much higher.

What of the question of responsibility ? Where does it rest ? Directly, upon the individual whose business it is to be thoroughly conversant with all his duties and requirements ; indirectly, upon the profession, and the laws that govern it, whose rightful province it is to *know* that the individual *is* properly fitted before he is permitted to enter it.

In this connection it may very properly be observed that a collection of such cases—and they are collectible—as the one related, would form a very strong—indeed, an unanswerable argument in favor of the law establishing a State Board of Medical Examiners. It is certainly a much-needed measure. and the writer would further observe that he believes it is not so much needed on account of the young or recent graduates

—those who are coming up to the requirements of our regular medical colleges—who are from year to year entering the profession, as it is for a large class of so-called doctors, operating mainly in rural districts, who are not only without diplomas, but without any medical training at all. The country, in some parts, is full of such men. The case cited was one of this kind. The young man, only a short time from his college halls, was *right;* while the older man, with fifteen or more years of experience, was *wrong.*

Make your law so that its requirements shall be *fitness,* whether the experience has been one or fifty years, and "let no guilty man escape" under any fifteen years' saving clause. In this matter alone there is a responsibility of no small magnitude; and, while the efforts of this Association are being so rigorously directed toward the removal of causes, and the prevention of the spread of disease, when its contagious nature has been fully established, let it not be forgotten that, in this matter of the early and speedy determination of the character of such ailments, there is a field that still needs careful and resolute attention.

To successfully war against disease, to meet and conquer it, when it boldly marches forth on its errand of destruction, in the strength of its full development, is, to say the least, extremely commendable; but, to surely recognize it in its very incipiency, especially if it breathes out contagion and contamination, and there to securely manacle it, thus destroying its power to do extended harm, is a far grander and nobler thing to do.

THE RESULTS OF A MISTAKEN DIAGNOSIS.

By Thos. W. Gordon, M.D., Georgetown, O.

In the autumn of 1871 a young man, A. L. (a German), who was by trade a tailor, was carrying on his business in Georgetown. He visited Cincinnati and then returned, and a short time after was taken sick. An M.D. of mature age and of many years' practice was called to visit him. The doc-

tor considered the disease "chicken-pox," and so proclaimed it. The sick man was boarding with a half-brother who had a family of children; he and the brother's family occupied the second story of the house. The lower story was occupied as a family grocery by the half-brother, C. S., who had a general and extensive trade. Communication was open and free between the grocery and the rooms above, and the grocer and members of his family. The customers coming and going at will without any suspicion of danger.

One evening I was in another grocery-store making some purchases when an intelligent mechanic, L. W., called, and made a remark in relation to the chicken-pox at C. S.'s. He said he had never turned back from disease or death until that evening, but that on that occasion he had been very sick while assisting "in laying out" a little girl that had just died of chicken-pox. A physician present asked him what was the appearance of the child he had assisted in dressing. His reply was, "She looked like she was covered with little white beans." He was told that there could hardly be any doubt about the case being one of small-pox, and that the pustules were just filled or filling at the time of her death. There were several persons present at the time, and the physician's remark made a decided flutter in the crowd; and to some extent there appeared to be an inclination on the part of two or three to risk an approach to the sick-room in a spirit of bravado as sustainers of the former diagnosis. The dead child was taken from the house and buried by the people, as is usual in case of death from any ordinary uninfectious disease, and trade was continued in the grocery without interruption by some of the citizens, although others had taken alarm by the report that one of the physicians of the town had said the disease was small-pox, but it was argued that he had not seen the patients.

Thus progressed the discussion until all of the family were prostrated, including the father and mother and four children, as stated above, one of whom died. The father and mother having varioloid, having been vaccinated years before. Then a brother-in-law of the grocer, who was and yet is carrying on a grocery of family supplies with a saloon attachment, who had visited the sick family and attended the funeral of the

child, as I was informed (I was not personally cognizant of the last statement) was taken sick, as was also his wife. The physician attending the last-named family proclaimed their disease to be typhoid-fever. The last-named grocery was a kind of rendezvous for several loiterers.

L. W., who had assisted in preparing the little girl for interment, sickened and died of small-pox. A mechanic, T. W., who worked in his shop, also died of small-pox, as did one of L. W.'s children. The second grocer and his wife proved to have varioloid. The hired girl working for them sickened, went home in the country, and died of small-pox.

Two of the persons who made the second grocery a lounging-place conveyed small-pox. One took it himself and died of the disease, and the other, J. K., conveyed it to his family and one of his children died. Two young men, H. T. and Lindsey, from the country, several miles apart, lunched at this grocer's, both took small-pox and both died. A child being raised by J. S. also took the disease and died. J. S. lived directly across the street from the second-named family grocery, in upper rooms, while A. N. lived in rooms below ; A. N. had varioloid, called chicken-pox, was attended by the first-named M.D. From him his three-months' old babe took small-pox and recovered. No doubt the little girl that died in the upper room contracted the disease from the cases below called chicken-pox.

In the mean time the first "chicken-pox" case had recovered and was carrying on his business as a tailor.. A young man, Kearns, from the county six or seven miles, came to the shop and had a coat-pattern cut. He went home, sickened with small-pox and died. A young lady, resident of Georgetown, daughter of N. D., got cloth for a pair of slipper-uppers from the tailor-shop, did the needlework on the material, took small-pox and died. A young boy, C. T., living in the south-west edge of the town, who went to the first-named grocery for family supplies, took the disease. His mother, who nursed him, contracted it from him and died, while the boy recovered, with pits numerous and large, which now disfigure him. Mrs. J. C. H., a married lady, who was engaged at dressmaking, contracted the disease and died. Major H., who refused absolutely to be vaccinated, contracted the disease, was boarding

at a hotel, was removed to the "Pest House," as it was called, and died.

One of the physicians of Georgetown said to me one morning that his son, a youth, was quite sick, and asked me to visit him, which I did immediately, and found a case of small-pox, but not fully developed. I vaccinated all the members of the family then at home, the doctor and his wife included. The mother nursed her son through his illness, and her revaccination was perfect. The doctor's former vaccination protected him and only the son had small-pox. The same morning that I was called a niece of the doctor had just arrived from Cincinnati without a knowledge of the disease being present. She felt no fear of the disease as she said Dr. M., of Cincinnati, had told her she was safe for all time. I asked to see her arm and found two smooth scars nearly or quite as large as a silver dollar. I told her I did not believe she was protected, and revaccinated her, and proved my opinion correct by the result.

The sheriff of the county, J. D., called on me to vaccinate his family, which I did, together with himself, although he thought it unnecessary in his case as he had had small-pox in Ireland when he was a boy of seven years of age. Yet the vaccination was as perfect in his case as in his infant child and all the other members of his family. I revaccinated many who had regularly pitted scars. Among them occasionally one took as perfectly as those where no attempt at protection had ever been made. I think the largest perfect scab I ever saw came from the arm of the present auditor of the county, J. J., and the old mark appeared all right on his arm as it did on the arms of all of his father's family, yet every one of those cases took perfectly.

When I first heard that an adult had chicken-pox I went into an adjoining dwelling of a family of most robust, healthy children that I had known all their lives, and had known the father from his boyhood, and asked to be allowed to vaccinate the two younger, saying to the mother that I had no doubt the virus would be needed badly by the time it would be ready. I had a little humanized virus that I knew to be pure. I vaccinated first from humanized virus, and afterward from the bovine. I have never had any serious cases from the former, but several terribly ulcerated arms from the latter.

There were no sanitary regulations in our town, as is self-evident from the detail of the fearful, and, I think, criminal, carelessness displayed in allowing this disease to spread. Since then a case occurred—a young lady who refused absolutely to be vaccinated when the disease raged in Georgetown in 1871–72. Several years afterward, 1884, I believe, she visited Cincinnati, came home, was taken sick with small-pox and died, but the former lesson was not lost upon the people. The town took action, the Board of Health *for once* was supported by the Council. The afflicted family was confined to their residence and no person allowed to enter the dwelling excepting under the most carefully guarded sanitary rules. A nurse was employed, and a man designated to take provisions and all needed supplies to the dwelling for its inmates. As soon as it was announced that there was even a fear of small-pox in this case, a brother of the girl, who also had utterly refused to be vaccinated when the disease prevailed in Georgetown before, came to my office to be vaccinated. He was frightened almost beyond belief. I vaccinated and revaccinated the entire family, excepting the young lady who had the disease, and only the one case occurred.

I have attended a single case of small-pox in town and country on several occasions, and have never had the disease spread from the single patient, having in all cases vaccinated or revaccinated the entire family, and then ordered the utmost care to be used by all persons who came to the house or were allowed near it. The medical gentleman who formerly reported the case of "chicken-pox," in company with the doctor whose son was one of the afflicted in the winter of 1871–72, attended the young lady, which was the last case of small-pox that has occurred in Georgetown. Had there been the same care used in 1871 as in 1884, about twenty lives would have been saved and an untold amount of suffering and expense prevented.

The mistake in the diagnosis in the first case, together with the extreme carelessness, ultimately gave eighteen centres from which the disease spread. Almost wholesale vaccination and extensive revaccination prevented hundreds of deaths where a single score occurred.

The financial loss to the town in a business point of view

cannot be accurately estimated, but it reached many thousands of dollars. When it was known in the country that there was small-pox in town trade almost entirely ceased ; and for months after there was no danger from contagion of any kind, and every vestige of small-pox, and every garment that had been near a case had been thoroughly cleansed, renovated, or destroyed, and every room disinfected, the people of the country feared to visit the place. And the former extensive trade that was enjoyed there was dissipated by being carried to neighboring towns.

A FEVER EPIDEMIC FROM DRINKING SEWAGE.

By C. E. Kurz, M.D., Bellaire, O.

The city of Bellaire, in Belmont County, is spread along the Ohio River on its western bank, and is about three miles in length. The greater part of the city is built on bottom land, and, consequently, is sandy. A small portion of it is on the hillside. I have been a resident of Bellaire for nearly seventeen years, and have been in continued practice there during that time.

The population in 1870 was about 3000, and now it is 12,000. Typhoid-fever in the early years of my practice here was rare, except in the fall after the rainy season. Since the considerable increase of population, without proportionate sanitary measures, epidemics have appeared at various times. Especially was this true after getting the water-works, the power-house of which is situated a few yards below the mouth of a creek into which a number of sewers empty, while the sewers of the fifth ward empty into the river above the power-house. In addition to our own contamination there is Wheeling, W. Va., just above us, with a population of 35,000, her entire sewerage emptying into the Ohio River, the lower sewer being just one half mile from where we get our water supply.

Besides Wheeling, on the West Virginia shore, there are two other towns above us, on the Ohio shore, to contend with. Therefore, it is no wonder that we, the lowest of towns on the Ohio River with regard to location, should have at various times scourging epidemics. It has been proven that in the

dejections of typhoid-fever and cholera patients, germs have been found which, by the drinking of water thus polluted, find a favorable soil for their propagation. But let me not be misunderstood. I do not claim that the drinking water is, or has been, the only channel by which these germs enter the human system ; the sanitary condition of our town, which has been very bad, must also be taken into consideration.

In the latter part of May, 1886, the fever epidemic made its appearance, and reached its height during the month of June, and declined after the middle of July. During the month of August only a few isolated cases made their appearance. The total number of cases treated during the epidemic, as reported by our Health Officer, Dr. D. Q. Steere, was 308. Out of this number only 11, or $3\frac{4}{7}$ per cent died.

A statistical report from my note-book, as treated by myself, shows the following :

Total treated during the epidemic, 59. Of these 18 were married, 41 single.

With respect to ages 3 were over 50 ; 7 over 40 ; 12 over 20 ; 23 between 10 and 20, and 14 between 5 and 10 years. Total 59. Of these 21 were males ; 38 females.

With regard to duration of sickness, the longest was 31 days, the shortest was 7 days.

The number of typical cases of typhoid-fever was 11 ; of malarial type 48.

Complications of hemorrhage from the bowels in 3 cases ; delirium in 5 cases ; diarrhœa in every case ; epistaxis in none ; tympanitis in none ; subsultus in none ; no pulmonary complications ; tenderness over the ileo-cœcal valve in almost every case, as well as over umbilicus ; eruption in every typical case.

The highest temperature reached in any case was $104\frac{1}{2}$. The average temperature ranged from 101 to 103. Three cases of walking-fever (*febris ambulatorius*) occurred. They made a good recovery. Deaths, none.

Some of the children had, during the first week of their sickness, very slight epistaxis, sometimes not more than two or three drops.

Treatment. After emptying out the *primæ viæ*, I gave quinia, carbolic acid, and tincture of iodine.

Diet. Milk, beef-tea, and whiskey. Diarrhœa was checked by opium and bismuth. Very few could digest milk and had to rely upon beef-tea and whiskey. Cool baths to lower the temperature, and ergot for hemorrhage. Convalescence in all cases set in very slow.

I now come to the all-absorbing question of the day, and one in which every intelligent and conscientious physician is concerned, and that is, how can these epidemics be prevented?

I think by the strictest sanitary regulations, and the purest of drinking water. Pure drinking water can be obtained by having good springs from the suburbs brought into the cities, and used for drinking purposes alone from public fountains, as it is done in European cities, where it is not uncommon to bring spring water 200 or 300 miles.

But I do not claim that drinking water alone was the cause of our late epidemic, which I will illustrate by an example:

In Benwood, a town of 2500 inhabitants, across the river from Bellaire, where no river water is used, a similar epidemic made its appearance last September, and continued with some severity until the middle of November. Dr. Leonard Eskey, the Health Officer of Benwood, kindly gave me the following statistics:

Number of cases treated during the epidemic about 250. Among 150 cases treated by Dr. Eskey, about 20 were of a typical character. Among all the cases there were but 6 deaths.

Very extensive excavations had been made for the building of Steel Works, and this was the part of town most affected by fever. The earth that was dug up being exposed to the sun, rain, and atmosphere, was thoroughly saturated with filth, excrement and offal, of this low part of town, for a generation. From the rapidity with which this fever developed, it seems reasonable to conclude that the miasma arising from the new ground was the cause. A microscopic and chemical examination made of the water failed to reveal any typhoid-fever germs, and very little matter of an organic character by the chemist.

Again, the analysis of the Ohio River water, which, as a matter of course, will vary at different times, showing very different results accordingly as, at the time of analysis, the

river was high or low. Through the kindness of Dr. Garrison, the Health Officer of Wheeling, I received Professor Dwyght's analysis when the river was comparatively low last summer. It showed :

Free ammonia per 1,000,000 parts 1.25=12.5 too much. Albuminoid ammonia per 1,000,000 parts 1.3=65 times too much. The water from which these results were obtained was taken from the river above the pumping station.

The question of to-day is, not how to cure, but how to prevent, diseases, and as the latter is easier done than the former, therefore this assembly from different parts of our State is here to provide ways and means for the health of the public, as " public health is public wealth."

It is my opinion that these diseases, in some measure, can be prevented by the use of pure drinking water, and crematories to dispose of night-soil and offal as well as of the dead.

WATER-CLOSETS AND PRIVY-VAULTS.

By John McCurdy, M.D., Member of City Board of Health, Youngstown, O.

What is any house, however elegant in appearance or expensive in construction, without one or both of these appliances of the most recent pattern, but a modified " Black Hole of Calcutta ?" It is but a place of confinement where malaise, headache, debility, and low vitality dwell, and where the organic germs of fever, diphtheria, scarlatina, measles, cholera, and small-pox find their foster-mother, instead of the abiding-place of buoyant health, rich and pure blood, steady nerves, strong muscles, and large stores of reserved vitality. To understand the laws of sanitation, and apply them with precision and certainty, in every case, is to be more thoroughly acquainted with the laws of organic and inorganic substances than we have ever been. The sanitarian of to-day, to be at his best, should be familiar with all that chemistry can teach, mechanics demonstrate, and engineering plan.

But to our subject, and first, What can be said regarding water-closets ? The three classes of men who prosecute both the science and art of sanitation, viz., the physician, the

plumber, and the engineer, have studied this problem together and singly. Closets have been invented as numerous and various in style as the leaves of autumn, whose projectors claim for them, not only certain protection against emanations from human excreta, but that will flank, surround, and compel to surrender all the forms of bacteria, bacilli, micrococci, and their vast progeny. The essential parts of all are the bowl, the container, the trap with water seal or seals, supply, soil, and vent pipes. Some combine all the above parts in their construction, some only a portion. The dominant thought that has filled the minds of all closet-makers is how to control the gases, and, especially, the disease germs. With every form of closet, save one, the trap in the soil pipe is relied upon, whether leading from closet, bath-tub, or kitchen sink. Without this trap the more sewers, soil pipes, waste pipes, and even ventilating pipes we put into our houses the more surely will they be only dens of thieves to steal our health, and threaten, and eventually take our lives. What, then, is the nature of this seemingly imperative necessity? It is simply a bend in the pipe leading from the closet, a half *S*, three-quarter *S*, *S* or *D* bend; or a bag-shaped, a bottle-shaped, or a bell-shaped cup in the waste pipe.

As the art of plumbing is more and more advanced the simple half or three-quarter *S* is preferred. Of course these bends are so placed that the depending portion is intended to be at all times filled with water. The water thus contained is called the water seal. And this little pool of water, often very impure, very offensive, and very foul, is all that stands between us and the death-dealing sewer-gas loaded with disease germs.

It is not mysterious then that "the silver chord" of health is so often loosed, and "the golden bowl" of life so often broken. How aptly the lines descriptive of the insane apply to those who live in badly plumbed houses:

> "They hear a voice we do not hear, that says they must not stay;
> They see a hand we do not see, that beckons them away."

I cannot speak of all the kinds, or even all the leading kinds, or, perhaps, not even of the very best kinds of water-closets, for they are legion.

The first I notice is the "Hilliard Hopper." This is one of the simplest in construction, having a bowl attached to a

four-inch soil pipe with a three-quarter *S* trap. A tank is used for the water supply, and is self-acting, that is, pressure upon the seat causes a dash of water to wet the bowl, and, upon removing pressure, an additional dash completes the action. The last dash is supposed to carry the contents through the trap and leave it full of pure water. For places where this closet is in almost constant use it answers fairly well; but for occasional use I do not approve of it. In the first place it does not use enough water. Secondly, while in use the emanations from the deposit are constantly passing off into the apartment. And, thirdly, the rush of water is not always sufficient to carry the deposit well through the trap into the soil pipe. Indeed, occasionally, a considerable portion is left in the trap to decompose and poison the atmosphere.

The next is the "Zane Sanitary Closet." This is much more complicated, and, in some respects, a better closet. It has a double protection in the form of two water seals—one in the pipe and one in the bowl—and uses more water. Very similar in construction is the Demorest. They are both plungers, with flushing chambers. These closets have many excellent qualities, and are generally satisfactory to those who use them. My objections to them are that nothing leaves the bowl when in use, and will not leave it except the handle is pulled up, so that they are not well suited for children, imbeciles, and careless people. But in the opinion of Dr. Tracy, of New York, and others, the most threatening defect is in the plunging chamber, which in time is coated with a very foul organic matter that is a favorable bed for the rapid culture of disease-producers. In many of the most carefully plumbed houses of our town, containing these closets, diphtheria with its terrors has again and again visited different members of these families, and the suspicions were centred in the flushing chamber as the cause. I only note this suspicion. My own knowledge does not verify it.

I am favorably impressed with a closet made by the Kelly Brothers, of Chicago, called the "Self-acting Wash-out Closet." While not familiar with its actual working, I would consider the time well spent, had I a house to furnish, in making myself thoroughly acquainted with it.

Can we get something better than the common *S* trap, or,

at least, that which will assist in making the seal more perfect? Many efforts have been made and appliances adopted. Notably among them is the Bower trap. This is combined with a rubber ball which is held in its place against the outlet of the waste pipe by flotation, and so remains while the closet is at rest, and prevents the passage of gases or liquids through the trap, from its outlet to its inlet. My experience with this trap is favorable, but some close observers urge that when it is brought into action, upon displacement of the ball by the outrush from the container, gases immediately under the ball, which have served to keep it in place, are liable to pass upward into the apartment.

Another ball-trap on a wholly different plan is the invention of H. C. Lowrie, C. E., of Denver. The rubber ball in this is filled with shot, and for a four-inch pipe weighs four and a half pounds, and so firmly is it seated that it takes twenty-five pounds' pressure to displace it. The trap has an elbow or "race-way" through which the ball rolls when displaced from it seat by the weight of the outflow, and immediately takes its place again, when the waste has passed, and firmly keeps it. Thus forming a perfect seal and doing away with all vent pipes.

Had I a house to plumb I would find a man with a conscience and skill, and an enthusiast in his profession, and would say to him: Bring the best goods known, take your time, put them together, and I will pay you by the hour; and don't forget for an instant you are in "the life-saving service." The builder of a home is as helpless in the hands of the plumber as he is, when sick, in the hands of the doctor.

I close what I have to say on closets with a description of the exception—the "McAndrews' Spray Seal Trapless Closet." The inventor is a resident of Youngstown, O.

This inventor throws aside traps and vents of every kind and places the closet upon a straight soil pipe. This closet consists of a seat, with air space in front between it and bowl, two supply pipes, one for the flushing rim and one for a spray seal near bottom of bowl, a copper cup, with or without a rubber ring, that comes up and surrounds lower end of bowl and contains water on both sides of said end. It operates as follows: Pressure being made upon the seat the cup is at once carried to the side, the valves of both supply pipes open at

the same moment and two strong streams of water flow, one around the rim, and the other dashing in a thick sheet of spray across the lower end of bowl before falling into a straight soil pipe. The action of these currents produces a rapid suction into the soil pipe, carrying with it instantly all deposits and gases. These currents are continuous, and cease only when the weight is off the seat, at which instant the cup again takes its place and is rapidly filled by the last portions of water of both supply pipes. Here we have an odorless closet, and one that neither allows gases nor deposits to remain an instant in the bowl, a quality no other closet has of which I have ever read or seen. It was put to a crucial test in one of our plumbing shops. Three of the approved closets were placed in a row with it over the same soil pipe, a four-inch, and fitted for use. This soil pipe was heavily charged with illuminating gas, and, although used repeatedly, not the slightest odor could be detected either during use or at rest. I have no hesitation in pronouncing it by far the best closet with which I am acquainted, and I say this with the qualification required by the Government pension regulations, viz., "I hereby certify that I have no interest either direct or indirect" in this closet.

Privy-vaults are, to-day, the most unmitigated and unpardonable nuisance that infests the face of the earth. Yet there is not a city, town, village, or country that is not honeycombed with them.

This is not only a threatening subject, but an absorbing one, for ninety-nine hundredths of the contents are absorbed by the earth. I ask how can we continue to live here if the ground beneath us is to be rendered foul as the air around us?

It is but a question of time when all our surroundings will be fully saturated—the ground air charged with virulent poisons, and the ground water saturated with the germs of death.

Each brick will suck up and hold at least one pint of liquid excrement; each stone absorbs the same as a sponge. Now, with a vault walled with several hundreds of bricks or many tons of porous stones, either or both of which are fully saturated with excrement, which in turn is surcharged with bacteria, bacilli, micrococci, and all other germs possible to convey or generate disease, and as these pass into the air or ground in-

stantly, the same pores are again filled, this time it may be with the discharges of cholera, typhoid, scarlet, or yellow-fevers, diphtheria, dysentery, small-pox or measles, and so this evaporation and absorption continues night and day, week following week, month month, and, generally, year year.

The town in which I live, I doubt not, is far above the average in its sewerage, water supply, and general hygienic condition. There are more than 30,000 people living in the township, and fully 25,000 in the corporate limits. Our Health Board was established about fourteen years ago, and for intelligence and proficiency, this board, in my opinion, has been at all times fully up to the average.

The sanitary condition of our town is, therefore, as follows: About 13,000 are supplied with closet, water-carriage, and excellent sewer connections. There are about 400 vaults built of brick, stone or cement, and about 350 dry-earth boxes; and, let it be added, to our disgrace, there are yet 1550 old-fashioned planked and leaky vaults in use. These figures are not absolutely accurate, as the inflexible rule of the Health Board is to allow no new plank vaults; but either sewer connections, dry-earth, or water-tight vaults must be substituted when the old planks decay, and also in all new structures.

What, now, does this condition of things bring about? Well, the result is: about 10 tons of excreta are daily, or more than 3800 tons yearly, deposited in these 1550 receptacles, the major part of which finds its way into the surrounding soil or passes off by evaporation, leaving very little for the scavengers. And with the 400 water-tight vaults, so-called, of the kind which, I believe, every city in America allows, 1500 tons yearly additional are allowed to render their surroundings putrescent, this noisome mass being removed but once a year.

The question now crowds itself to the front, Is there any other good way of disposing of excreta save by closet and water-carriage? Yes; let every hole, vault, and receptacle be cleansed and filled with clean, fresh earth or ashes, and place the privy upon a solid and well-aired foundation convenient to the house but sufficiently secluded, and if said privy is six by four feet place under it a box seven by four, this same being kept off the ground by substantial stone corners, and this whole problem is solved, while purity, health, decency

and comfort are secured. This box can be furnished water-tight, thoroughly coated inside and out with hot coal-tar, and placed in position for $2.25.

The projecting foot is covered with a neatly-fitting plank, which is all that is displaced and set aside in the removal of contents. The scavengers of our town are anxious to contract for their proper care, removing contents without the knowledge or supervision of the owner, and disposing of same at the rate of $4 per annum.

All the housewife is asked to do is to save the ashes, and throw them into this box, and not upon the ash-heap. Use lime, or earth, or copperas if there is supposed to be occasion, but which, with my daily experience of ten years, is, in my opinion, not necessary, the ashes alone from an ordinary house being amply sufficient.

The system I advocate is not only suited to the isolated cottage or elegant country home, but also to the mighty city, as year after year demonstrates in the case of Manchester with her half million of people, or Glasgow with her hundreds of thousands, or Rochdale or Heidelberg with their tens of thousands.

THE SANITARY CONDITION OF SANDUSKY BEFORE AND AFTER THE COMPLETION OF THE WATER-WORKS AND SEWERAGE SYSTEM.

By Elwood Stanley, M.D., Acting Assistant Surgeon U. S. Marine Hospital Service, Sandusky, O.

Sandusky is located on the south shore of Sandusky Bay, 41° 32′ 10″ n. lat., and near the centre of the northern line of the State. The location of the city is the most desirable, healthful and pleasant that could have been selected. The ground gradually rises as it spreads out far beyond the city limits southwardly, starting at an elevation of forty feet above the level of the water in the bay, and gracefully unfolding a beautiful extending landscape. The soil covering the site of the city is shallow, and under it is a substratum of blue and white varieties of limestone rock, which is a very valuable and durable substance for buildings, for macadamizing streets, and

for the various purposes in commerce for which limestone of good quality is adapted.

From the first settlement of the city to the time the water-works and sewerage system was completed, its sanitary condition was very imperfect. This in part was attributable to the fact that the rock is near the earth's surface. There was very little other than surface drainage to rapidly carry away the accumulated filthy and stagnant waters, and thus to keep the soil and air dry and healthful. The city, however, always had this natural advantage.

Instead of being flat and level, the ground over much of its area has a decided declination toward the bay, which, with its inlets or arms, surrounds the city largely on three sides and at the same time furnishes the very best natural fall and receptacle for all surface drainings. By this means the movements of the surface water were in many parts of the city rapid. In the level portions of the city, on the other hand, the lack of proper drainage bore, as it always does in every thickly populated district, the inevitable result—a more or less decomposition of animal and vegetable matter which promotes the development of intermittent, remittent, bilious, typhoid, and scarlet fevers. Diphtheria, diarrhœa and dysentery also prevailed in some seasons to a considerable extent.

Then, again, the rock being so near the surface, it was difficult to obtain sufficient drainage for factory refuse and stagnant pools, and to effectually get rid of dirty house waters. In gutters and low spots of ground in many places, the gases showed themselves on the surface of these polluted waters in the form of bubbles, and when they burst and discharged their noxious contents they seriously affected the health of the people. In many parts of the city were wells, which are always suspicious sources of water supply, and particularly so when the water is obtained by boring in lime rock till a crevice is struck in which it is found. In such rock it is practically impossible to secure a supply free from surface overflows and disease-breeding seepage, and never in thickly populated districts. While acting as health officer several years, I deemed it my duty as far as consistent with law to prohibit the use of water from such sources for culinary and drinking purposes, with the firm conviction, strengthened by almost thirty-eight years of

unbroken professional practice in this community and covering the two periods of the terrible cholera scourge of 1849 and 1852, that contamination with disease-breeding matter is sure to follow the use of the waters from such wells. It was my province to attend the sick and dying during both those periods, and my conviction on this subject is the result of a personal experience and observation, the like of which I hope none of you may be called upon to pass through. I found that in every district in the city, and also in the outlying villages, where the cholera was most widespread and fatal, the people were depending upon wells cut in the rock for their domestic water supply. Several of these were public wells, and in the immediate communities about them the scourge swept with most terrible and death-dealing force. I recall especially one well in a thickly populated part of the city from which water was obtained for culinary and drinking purposes by a large number of citizens living in the immediate vicinity. In the year 1849, during the widespread prevalence of cholera in this country, it was most fatal in our city in the vicinity of this one well. The pollution of the water in this well, particularly after a rainfall, was fully established, and it being, as was supposed, the means of so fearful a mortality from the ravages of cholera in this immediate locality, water supply from this well was at once prohibited.

Cistern water soon came into general use more and more until it became popular with the people, and in a short time was practically the only supply for domestic purposes up to the period that the water-works system went into operation.

The water-works system in Sandusky was adopted and the work begun in the year 1872. Its construction, by blasting the rock so that the iron pipes could be laid below freezing-point, was attended with more than ordinary complicated, expensive labor. The water is taken from a crib in the bay built of 12x12-inch timbers, the space between being filled with broken stone. From the crib a wrought-iron pipe 3 feet in diameter and $\frac{1}{4}$ inch thick extends to the pump well, a distance of 1800 feet. From the well it is pumped directly into a metallic reservoir or standpipe, 25 feet in diameter and 180 feet high, from which it flows gradually into the mains.

The one great question of vital interest to the public health

at the start was whether the bay water was adequately pure. Thorough and exhaustive consideration was given to the subject. To satisfactorily settle the question, samples of the waters, both from the bay and lake, were sent to the analytical department of the Michigan State University at Ann Arbor, for analysis. The analyses proved that the water in the bay was fully equal in purity to that of the lake beyond.

It was apparent soon after the city's water system went into operation that it was essential that the lateral sewers connecting with private dwellings be so constructed as to effectually carry away the waste water from all hydrants, otherwise the ground under and around dwellings would be constantly wet and the air damp.

The sewerage system was fully adopted in 1882, and there have been laid up to this time almost twenty miles of pipe sewers along the streets, exclusive of lateral connections with dwellings and other buildings.

Sandusky differs from nearly all other cities in that it needs no special expenditures for the proper disposal of its waste water and sewage, as all the sewers throughout the city discharge into the bay, the rapid current of which carries the waste water and sewage out into the deep waters of the lake.

Sewer-gas requires more attention, care and time in the construction of lateral sewer connections with buildings than any other one department of the work connected with a sewer system. There seems to be no doubt that sewer-gas is the direct cause of zymotic diseases, as well as the indirect or remote cause of numerous other diseases, and that all diseases are enhanced or aggravated by its presence. Pure air is nature's first essential for health. Hence it becomes of the utmost importance to the citizens of all cities to know not so much what are the constituents of sewer-gas that breeds disease, as how shall they be protected from it.

It is evident that proper ventilation of sewers at the manholes and thorough and constant flushing are the great prerequisites. By these latter means all excrementitious matter is carried away before the septic changes take place, and the formation of sewer-gas is thereby in a great measure prevented. Consequently, the food in which epidemic diseases have their origin and feed upon are also largely prevented.

To secure these three things: First, an adequate and self-cleansing repository for the discharge of the sewers; secondly, thorough ventilation, and, thirdly, their effectual and frequent flushing are the first and great essentials to be considered in the establishment of every city's sewerage system. They are far more important than the cost, or the rate of tax to be levied for their payment, for the health of our firesides, the very lives of the people depend upon them. Men too often wrangle over the former, and ignore the latter.

The sanitary condition of Sandusky since the completion of its water-works and sewerage system has been exceptionally good. Its streets have been greatly improved; they are now well graded and macadamized, are frequently washed, and kept clean and in good order, the sewers often and thoroughly flushed, and the manholes well ventilated. The cleanly condition of its wide avenues and thoroughfares is a matter of frequent comment by strangers visiting Sandusky. The city is enjoying a solid, substantial growth, and it promises to be in the future, as it has been of late years, one of the most healthful and delightful cities in the State.

THE SANITARY CONDITION OF THE CITY OF MEXICO FROM PERSONAL INVESTIGATION.

By E. D. Shreve, C.E., Bucyrus, O.

The city of Mexico is situated near the centre of a comparatively level plain, known as the Valley of Mexico. The western boundary of this valley is the continuation of the great mountain chain which forms the backbone of the North American Continent. The southern boundary is a mountain chain which crosses the continent from east to west. The south-western corner of the valley is formed by the junction of these two mountain ranges. At the south-eastern corner is the great extinct volcano, Popocatepetl, whose snow-capped summit reaches an altitude of 17,720 feet above the sea level. A spur is thrown off to the northward from the east and west range; and a little north of the volcanic peak is a massive mountain, snow-capped and nearly as high, known as the Woman in White, from the peculiar configuration of the sum-

mit, which is the culminating point of a long, gradually ascending ridge that forms the eastern boundary of the valley. On the north, the boundary is formed by a succession of isolated peaks, that make the connection between the main range running north and the spur from the east and west. The inclosed area is oval in shape, about 55 miles from north to south, and 37 from east to west, making the circumference along the crest of the mountains which environ it on every side about 200 miles. The area inclosed is about 1700 square miles. Scattered through the interior of this area are many cones of craters, long since quiet, but which give unmistakable evidence that they have all been active at some period. It is also evident that these low craters were once high peaks, but the volume of lava, dust, mud, and volcanic sand belched up from the bowels of the earth has been sufficiently large to fill up this area, which was completely walled in on three sides, and afforded only a very limited outlet on the north between two or three peaks.

This flow of volcanic matter spread over the inclosed area like a sea, and now that it is solid, there are large areas of comparatively level land high up among the peaks, and in the midst of one of the most densely mountainous localities in the world. Where the deepest fill occurred, there the greatest settlement has taken place, and over such areas there are now shallow lakes. Taken as a whole, the central portion has settled more than the rim, and if it were not the case that during nine months of the year there is no rain in the valley, or the rate of evaporation was not so great, the entire plain would be covered with water to the depth of 200 feet or more, and instead of a fine valley there would be a fine lake. As it is, there are six lakes in the valley, having a combined area of about 180 square miles. Their depth varies from one foot to twenty feet, but they will not average more than five feet. Tezcoco, the largest of these lakes, is near the centre of the valley, and has an area of 105 square miles. The average depth of this lake is only two feet. The deepest part is about sixteen feet. Tezcoco lies in the same plain as the city of Mexico, and the surface of the lake is but six feet below the highest part of the city area. This lake is the only outlet which the city has for drainage or sewerage purposes.

In the southern end of the valley are lakes Chalco and Xochimilco, on the same level, and having their surface about twelve feet above Lake Tezcoco. The waters of these lakes unite in many places, and, from their western end, passes the great vega, or canal by which the water of the lakes is carried to the city and used to flush the sewers and open ditches, and thus float away the accumulated filth into Lake Tezcoco, about four miles distant eastward. These southern lakes are fed from the snow-clad summits of the surrounding mountains and from springs in the bottom. Northward from Lake Tezcoco there are three lakes: first, San Cristobal and Xaltocan united by a strait whose surface is eleven and a half feet above Tezcoco, and next Lake Zumpango, with its surface twenty feet above Tezcoco.

In this manner the valley is divided into three basins of different levels: first, that of Tezcoco, being the lowest; second, between it and Chalco to the south; and third, that of San Cristobal, Xaltocan, and Zumpango to the north. The central plain, in which is located the city of Mexico, is protected from overflow from these higher basins by dykes, which, if destroyed would at once subject the city to an inundation from which there could be no escape or drainage. Repair of the dykes and evaporation of the water would be the only relief.

Lake Tezcoco has no outlet, yet it has been the recipient of sewerage and water wastes of the city and suburbs for about five hundred years. The water is bitter and salty, with a copious sediment incorporated with saline matter to the depth of over fifty feet.

Analysis of the water shows: Water, 98.890; carbonate soda, .485; sulphate soda, .051; chloride of sodium, .570; animal matter, .001; density, 1.0069.

There is no animal life in the waters of the lake. The surface rises and falls with the seasons. It is usually at its greatest height about the first of November. Evaporation, under unclouded sky and tropical sun, brings it to its lowest point in the following May, when the rainy season begins, reaching its height in August, when it rains daily, and continues till November.

The main sewers are placed with their bottom generally about

six feet below the street surface, or nearly on a level with Lake Tezcoco, into which they are supposed to empty. They are built of stone, without mortar or cement, and are rectangular in cross-section, being generally two feet wide and three or four feet deep, and some of them two feet square. They are little more than elongated cesspools, often choked with solid matter. At all other times they are full of a sluggish flow of water as black as coal, surcharged with putrefying matter. Almost daily some of them are opened for the removal of obstructions. The filth is scooped out and emptied into tanks by men who enter them. Often these men stand in the filthy liquid up to their armpits engaged at their work, while the stench from these openings is stifling to an American a full square away. The contiguous soil is loaded with the same offensiveness as the sewers themselves.

Over a great part of the city area the soil water is, for most of the time, only from one foot to two feet below the surface ; and in some quarters it is never otherwise.

The sewerage, such as it is, is confined to the higher and better portion only ; the side streets, alleys, and lanes where the population is the most dense, have neither sewerage nor drainage except that the gutters, along the sides or in the centres of the streets and alleys, are generally paved and serve as receptacles for any and all filth that may be piled into them. Where there is any fall to these gutters the liquid is too thick to flow ; the dwellers along go out with brooms and splash it out on the sides, where the tropical sun soon removes the moisture by evaporation, leaving the dry solids to be scraped together with hoes and brooms and carted away by the public servants. On both sides of these narrow streets, within ten to twenty feet of these foul gutters, are the doors of the houses in which the masses live and die. Their houses are chiefly adobe, and in the poorer quarters generally of one story. Many are without back-yards or courts, trees, or shade of any kind, water-closets, or privies—frequently with but a single room, ten or twelve feet square, and here dwells a family of six or eight persons. No floor but the ground, no beds but straw or grass kept in place by a pole or some willow branches staked down. In some, rags and patches, pieces of quilts or blankets are spread over the " beds," and a few afford ticks to

hold the grass or straw, and, in addition, one, two, or three blankets or quilts. They seldom have a table or any chairs. For cooking they have charcoal stoves similar to those used by tinners for heating soldering-irons. On this stove is placed a piece of sheet-iron, on which they bake the tortillas, and do whatever other cooking they have to do. The food is commonly poor in quality and slim in quantity. The clothing, like the food, is both poor and scant. So it is with at least 50,000 people in the city of Mexico; they eke out a miserable existence in the midst of degradation and stench. The great wonder is that they can exist at all. It can surprise no one familiar with these facts to know that small-pox, typhoid, typhus, and lung fevers and consumption find a permanent abiding-place in such quarters.

Another 50,000 have a shade better clothing and food, but the same surroundings otherwise; a third 50,000 have larger and better houses. These three grades comprise nearly half of the population. The other half may be divided into two very distinct classes, the well-to-do and the rich. The former live in good houses with courts, on paved streets, and have their living apartments on the second floor, clothing and food without stint, and many can and do enjoy the luxury of a bath once in a while.

The rich class is unusually large for a Mexican city. With their hoarded silver they supply themselves with every luxury known to civilized life except freedom from the dreaded typhus. They cannot buy healthful houses where the water stands but two feet below the first floor. They are not wholly lacking in effort, however, to overcome these drawbacks to their otherwise favored city.

They have made several attempts to improve the drainage, but, so far, their zeal has greatly exceeded the amount of ready cash. But they are now beginning to have a just appreciation of their situation, and it is reasonable to hope that ere many years this beautiful valley and city will be relieved from the odious stench that now rests upon it.

The fact that such vast numbers of people, poorly fed, housed, and clothed, can exist in the midst of conditions so inviting to disease without a continuous epidemic, is strong evidence of the extreme healthfulness of the valley, if relieved of its pollution accumulated by human agency.

With existing conditions it is not surprising that the death-rate is high and increasing. The diseases are chiefly zymotic. Typhus-fever is among the most common, and with poor treatment, poor nursing, poor care in every way, the fatality of the disease is very great.

The death-rate of the city during recent years has been very constantly on the increase. For the ten years ending with 1876 the average was 1 in 33, having increased (almost regularly) from 1 in 42 in 1867, to 1 in 19 in 1876.

But besides the mortality attributable to soil and water pollution, there is here intensely associated the condition common to sickly communities everywhere—great poverty. And it is surrounded by such hardships and demoralizing influences that parents seem to prefer that their puny offspring should be laid away in the grave than to battle for existence against such great odds.

The whole matter was very clearly stated recently by a writer in one of the city papers of Mexico, as follows :

" The greatest and most beneficent gift that the present administration can bestow on the people of the capital city of the republic is drainage, which means the saving of thousands of lives and the prevention of much disease which in attendant expense forms a heavy tax that bears on almost every family in the city. Drainage at almost any price will be cheap ; it must be thorough, and embrace not only the drainage of the valley but the renovation of the sewer system of the city. To this work every energy of the municipality, fortunately free from debt, should be bent in aid of the work. The Federal Government should lend its aid in every needful way."

Since the foundation of the city by the Aztecs, upon an island in Lake Tezcoco, in 1325, it has been a centre of population. At the time of the Spanish Conquest the Aztec city is said to have contained about 120,000 inhabitants. Cortez destroyed the Aztec city, but he began the erection of another on its ruins, immediately afterward, in 1521-22. The population has often been greatly reduced by wars and internal strife, but never by any plague. In 1803 the population was 137,000 ; in 1830, 205,430 ; in 1875, 260,000, and in 1886, 320,000 within the city limits proper, and 100,000 more in the suburbs. Across the city from east to west is about two and a half miles, and from north to south is about two miles, making about five

square miles, averaging 64,000 persons to the square mile. The city is well laid out in squares, with streets forty feet in width and running about north and south, east and west. There are many courts and open spaces. The paved streets and courts are kept scrupulously clean by the city authorities. Urinals stand on the corners of the streets at frequent intervals, and are used by both sexes.

Abundant facilities for baths exist for those who can pay for them. The poor people bathe at will in the canals and open ditches about the outskirts of the city. Household clothing is also washed in the waterways round about.

The city water supply is brought by means of a great viaduct from the mountains west and south. The water is very warm, and has a disagreeable, sickening taste. There are large areas of land in the valley to the south and west of the city, only a foot to eighteen inches above the water-level, and in spots with the water over the surface. The entire country is cut up with small ditches in which the water stands most of the year to the depth of a foot.

The famous "floating gardens" lie immediately to the south of the city along and near to the vega or canal. These gardens have long since ceased to float, and are as much a part of the *terra firma* as any other lands in the valley, but their surface is but little above the water-level. The modern floating gardens are now on Lake Chalco, where they exist in great numbers.

It is a remarkable fact that, notwithstanding the presence of water in the soil everywhere at a depth of from one to three feet, the air is so dry that the dampness is not felt in the buildings except where there is but little circulation, and where the walls are damp through contact with the earth. Little or no fermentation takes place where evaporation takes place freely ; and the antiseptic properties of the dry air at the elevation of the city, one and a half miles above the sea, probably does more to protect life against the otherwise intolerable local conditions than all other influences combined.

The difficulties to be overcome in the drainage of both valley and city are by the construction of a canal thirty miles long, and ranging in depth from sixteen to eighty feet, and the construction of a tunnel six miles long through a ridge three hundred feet in height.

THE PLUMBERS' PLEA FOR REPRESENTATION ON BOARDS OF HEALTH.

By WILLIAM HALLEY, Master Plumber, Columbus, O.

THE danger and tendency in our form of government are to place men in office who are unfitted to meet its responsible duty with the requisite amount of ability and diligence. Political preferment instead of official capacity is too often the open sesame to public trust. The doctrine that "to the victors belong the spoils" may be food for politicians and a fair rule of practice in the general affairs of State; but when positions of public trust are to be filled whose duty requires technical ability and special adaptation, then it becomes highly expedient that politicians be requested to keep hands off.

Of all the various boards and commissions created and sustained by the State, there is none whose functions require greater technical ability and special fitness than the board of health. In order that it may be of benefit to the people and extend its usefulness to its full capacity, its complexion should not be characterized by any sort of partisanship. It should be composed of sanitarians, if the objects of a health board are to be attained. If it is made a party machine, party ends will be served, instead of the health interests of the people; and, accordingly, Democrats and Republicans will compose the board instead of sanitarians. This point is urged because sanitary boards die at birth when created by party men to serve selfish or partisan ends. It is urged because politics and sanitary matters are not on friendly terms; politicians make poor sanitarians. Yet the force of politics is such that however pure and just the appointing power may be, it is bound to recognize political rather than sanitary influences. It makes little difference how high a man may rank as a sanitarian, he stands little chance for appointment to a position for which patient study and long experience have fitted him unless he be a politician willing to serve his party. On the other hand, it makes little difference how low a man may rank as a sanitarian, his chance for recognition as such is measured by his political prestige.

The majority of city health boards in this country to-day are composed of *ex-officio* members of police boards, with the mayor or other municipal officer as president. The same laxity often obtains in the creation and maintenance of State boards.

But it is remembered that many towns and States have no boards, and police officers as perfunctory sanitarians may be accepted as an apology for *bona fide* health boards; and when the importance of public health is better appreciated, State boards will be constituted so as to comprehend the whole duty of public sanitation.

In what has been said nothing is intended especially for our own State board of health. Every member of this Association, all sanitarians, and the people of Ohio take pleasure in our having such a board. It is fair to presume, from the good beginning our board has made, that its members will prove themselves efficient servitors of the public health. It is not the object of this paper to find fault with what this board or any other sanitary board does do, but it does most emphatically complain of what they fail to do.

In the first place, all will agree that sanitarians of the broadest type should compose a health board. The mayor of a city or a State office-holder, as such, is no more fitted to serve on such a board than a shoemaker or an undertaker. Its work is technical and requires technical ability. No one profession or calling is able to hold sanitary science in the hollow of its hand. It has been the impression among legislators that physicians alone are competent to serve as members of State boards of health. Not all physicians are sanitarians, and the best medical ability on earth is unable to compass the whole range of *practical* sanitation. It is granted that medical knowledge is indispensable to a health board, but it requires the learning and skill of other callings to complete the full complement of a thorough, practical, efficient sanitary organization. Sanitary science to be of value must be practical; and the varied aspects of sanitation cannot be reached by medical wisdom alone, but by the technical knowledge and skill of mechanical art. The sanitary physician is able to approach the subject from the side of "preventive medicine," and in theory extend his observation in every direction, but he is un-

able to master the whole subject and reduce theoretic knowledge to practical results.

In the matter of house sanitation alone success will never be attained unless mechanical artisans, such as contractors, builders, architects, engineers and plumbers become interested in the work, so as to solve the problems of practical sanitation. The work of those who contribute to the character of buildings, public and private, is so important as to tip the balance either for or against the possibility of healthy homes and healthy living. People are little benefited by the classic display of verbose reports and technical dissertations on hygienic philosophy. We want something tangible, something practical—if need be, something compulsory.

The water supply of cities and dwellings, the sewerage of cities and house drainage, are some of the most important features of sanitary science. The work of the architect, builder, engineer and plumber has direct relation to the health interests of the people. It is well known that contaminated water supply and defective plumbing are among the most prolific sources of preventable disease. They are potent vehicles for the spread of epidemics.

It is not sufficient for boards of health to wiggle in and out of back-yards and alleys, and to have every object removed that happens to offend eye or nose. The scavenger is not a sanitarian, but one of his tools. Sanitation lies deeper than the sense of smell ; it is the substratum of judgment. It is not sufficient to clean the street, cellar and yard of organic decay. It is not sufficient to issue rules how to struggle through an epidemic and point its cause. Quarantine and vaccination are proper, but they are not sufficient. It is not sufficient to say that sewer-gas is dangerous any more than to suggest the danger from fire without affording the means of escape. What we want in sanitary matters is an organized body in authority, not only to point out the danger of possible conflagration and the use of "fire-escapes," but to teach the people, and if necessary to enforce them, to build with incombustible material. What we want is sanitary engineering, sanitary architecture and sanitary plumbing.

The architect has much to do in establishing sanitary houses. Holding the purse-strings, as he virtually does, of the owner,

he has almost absolute control. He can make buildings either sanitary or unsanitary. He makes provisions for lighting, heating, ventilation, drainage, etc. The builder and plumber must follow specifications, and their work in turn may invite or preclude disease, according as the work is done in accord with sanitary principles or not. Our churches, theatres, school-houses, dwellings, factories and business blocks in sanitation are just what these mechanical artists make them. The water supply and sewerage of cities are what the engineer makes them.

Medical acumen is able to show that the germs of typhoid and other zymotic fevers spread pestilence and death by means of impure water, poor drainage, bad ventilation, defective plumbing, and other misrule in house sanitation ; it is able to indicate that these things are evils, but it is unable to provide the best measures of relief. It is in the attitude of a lost boy floundering about the forests, knowing what the trouble is, but not knowing how to get out of it.

The vices of defective buildings and their unsanitary trappings have been known and proclaimed year after year by medical men, and yet the evils continue and grow worse with increased population. The men who form health boards, as a rule, know *what* the difficulty is, but *how* to remedy it does not lie within the pale of their professional skill. It is only fair to presume that physicians cannot be expert architects, engineers and plumbers. The knowledge and practice of these artisans are necessary to a competent board of health. Sewerage, drainage, engineering, architecture and plumbing are considered very important parts in sanitary science. If men whose professions and business in life it is to master these subjects do not give them their sympathy and work to the production of sanitary homes, then the labors of health boards to that extent become inefficient and puerile. If health boards are not wholly ornamental, their business is to look after the health interests of the people, and many of these, some the most important, are found in the work of these mechanical artists. Just in proportion as boards become practical and of service, they will embody the knowledge of these skilled home builders. They are practical sanitarians. The importance of their work has been forced upon them by sanitary reform.

For the most part they are taking hold of the new idea with both heart and hand. They have large opportunities for serving sanitary science. They are veritable practitioners of preventive medicine. Technical schools for their special instruction and periodical literature for their information have adopted the work of sanitation as the controlling factor in a manner that will sooner or later put health boards of the ornamental type to the blush of shame. Leading men in this constellation of working sanitarians know the value of their avocations as related to the public health, and they will never cease a vigorous strife till all the great army of colaborers is drilled in the tactics of house sanitation. These same leaders ask of the State and of the people, for the good of all, that they be allowed representation on boards of health.

In this way does the plumber ask for representation. He asks that some one well cultured in the practice of plumbing, engineering, architecture and the like, a practical artist, representing these sanitary arts, be placed in sanitary council—not for self-aggrandizement, but for the promotion of house sanitation. It is not the plumber or the architect that needs or demands membership on boards of health ; but plumbing and architecture, as strong elements in sanitary science, do not only demand but deserve representation. We are not arbitrary ; all we ask is that the work of the mechanical artisans be measured for what it is worth. Its perfection is of great importance. It merits representation and intelligent direction by one of their number, whether he be architect, plumber or engineer.

If improvement ever comes to house sanitation it must come —not from sanitary theorists, but from the finger-tips of mechanics. It is not only advisable to encourage the co-operation of these men in building healthy homes by giving their work practical representation on boards of health, but it is absolutely necessary to a realization of the benefits to public health that will not accrue in any other way.

The great trouble is, people build and plumb houses for convenience, beauty, and every other consideration than sanitary effect. Those who build to rent or to sell ignore sanitary rules entirely, use the cheapest devices, and employ skin workmen. In this way street after street is lined with unsanitary

houses whose occupants are the victims of avoidable disease, imposed upon them through the avarice of the owner and the neglect of sanitary regulation. In this way and through ignorance, house sanitation, despite our boasted sanitary reform, sanitary associations and health boards, can be found in reports, in text-books and in theory, but not in practice, not in homes, not in public buildings. From the State House down to the meanest hovel in Ohio's capital, sanitary arrangements are almost unknown. Indiana's new State House is another architectural display filled with unsanitary arrangements. These instances are not isolated cases. Go into the rank and file of our hotels and dwellings, and witness the unsanitary conditions displayed in horrible architecture and worse plumbing. Who is to blame, and what the remedy? Sanitary regulation in these matters—one of the aims of this society and of boards of health—will never be reached until organized effort, such as becomes the duty of said boards, is exercised by practical judgment. It lies within the influence of health boards to secure the creation of building laws, and these are the *sine qua non* conditions to sanitary regulations. It requires technical ability to draft and enforce these building laws. The only attempt at this reform in the State has been made by the mechanic himself, independent of all health boards to which the effort properly belongs. It is only reasonable to ask that practical ability be infused into health boards in order that house sanitation may become a living fact.

If you would reduce empty theory to practical results and thus solve the problem of healthy homes; if you would protect the health of the people against misrule—against bad sewerage, bad drainage, bad plumbing and bad architecture; if you would have wise and efficient administrations in house sanitation, you must place the work of its successful accomplishment in the hands of its masters, the sanitary engineer, architect and plumber, and give them working authority on boards of health.

A SCIENTIFIC STANDARD FOR THE SAFETY OF ILLUMINATING OILS.

By D. H. Beckwith, M.D., Member of Ohio State Board of Health, Cleveland, O.

Various health organizations have, from time to time, given attention to petroleum oils as illuminating agents, and the results of their investigations have usually served to modify legislation upon the subject. Unfortunately, however, there has been a lack of uniformity either in the experiments or in their interpretation, so that we now have in this country at least a half dozen different legal standards to which illuminating oils must conform, and as many different forms of apparatus, required to determine the several standards. Naturally, a certain amount of confusion results from this state of affairs. Oil that is legal standard in Indiana may not be so in Ohio, while neither Ohio nor Indiana oil will meet the requirements of the laws of Michigan. Some States employ the "flash test"—that is, the determination of the temperature to which it is necessary to raise a body of oil, in order that its vapor may be explosive. Other States employ the "fire test," or the determination of the temperature at which the oil itself ignites, and in some States there have been laws covering both these points. The object of all these legal tests is to prevent the sale of such oils as may be dangerous, and permit the sale of those grades only which may be used with safety.

The instruments which have been contrived for testing their safety vary from the simple open cup of oil heated upon a water bath and ignited by a burning match, to elaborate forms of closed cup apparatus, with nice mechanical adjustments for opening the flashing slide and electric spark for the ignition of the vapor, and attached aneroid for making barometric corrections of observed flashing points. Ohio legalizes one form of oil cup ; Indiana another ; Michigan another ; and other States still different ones ; and the results obtained by the different cups are various, 73° by the English cup being equal to 100° by the open cup, etc. Professor

Abel, appointed by the British Government to determine the best form of apparatus, devised the Abel cup ; the New York State Board of Health after careful investigation selected the Elliot cup ; the Michigan State Board of Health adopted the Wisconsin tester ; Ohio, the Foster cup ; Indiana the open cup invented by Professor Church ; Pennsylvania uses the burning test of 110°, which is equal to the Ohio test of about 90° flash test ; New York, New Jersey, Minnesota and Massachusetts agree upon a flash test of 100° ; Georgia with an open tester 120° ; Tennessee, 120° ; Arkansas requires 130° flashing point, but the law is comparatively a dead letter ; oils are used in that State of all grades.

The laws of Canada require a flash test of 96°. The chemist of the Standard Oil Works says that the Ohio test is nearly equal with the English and German tests ; that most of the oil shipped to those countries is sent with a flashing test of 73°. He claims that the flashing test of 100° is a perfectly safe oil, and that of the millions of barrels shipped during the last five years not 100 barrels have fallen below the required tests.

The problems relative to the standard of illuminating oils and the means of determining their standard are, in the abstract, purely scientific questions, and as such capable of exact solution ; and there is no reason, in the nature of things, why if oil that will flash at 100° is perfectly safe in New York, it should not be equally safe in Ohio or any other State ; and, on the other hand, if 120° flash test is the minimum limit of safety in Michigan, it does not seem right that a lower standard than this should be legalized in any State ; and, further, if the flashing point of an oil is the index of its safeness or unsafeness, since this is a physical constant of the oil, it should be capable of determination with reasonable accuracy, or, at least, its determination should always be made under such conditions that the errors will be uniform.

In comparing the various testers I have found many of them too much under the control of the operator. A slight variation in the manner of applying the fire would make a variation of a few degrees in the true test.

The commercial tester is the one used by the Standard Oil Works. They admit that the open cup is not as reliable as the Foster test cup. The open commercial cup has no cover-

ing, and a small quantity of air coming in contact with the vapor makes the test uncertain. The distance at which the gas-jet is applied above the oil cup is left entirely with the inspector, and he can easily, if he desires, make about the test required for the shipment.

A scientific standard should be adopted by all the States as to the test of illuminating oils. It should require a rigid investigation into the conditions under which oils are used as illuminating agents, the forms of lamps, lanterns, etc., in which they are consumed, and the precise nature of the conditions and circumstances under which they became dangerous, whether these are the breaking of chimneys, cracking or overturning of lamps, the overheating of oil-chambers, wick-tubes, collars, vapor; in short, to ascertain how and under what circumstances petroleum oil is unsafe for use. The elements of this portion of the problem being determined, if we know wherein the dangers lie, and have a physical expression for their limits, the rest is not so difficult. The dangers being marked out, their avoidance becomes a tolerably simple affair. For example, suppose that the source of danger in illuminating oils lay in heating the body of the oil in the lamp to, say, *n* degrees, and that if it remained below that point there would be perfect safety, and suppose that at *n* degrees (the expression *n* degrees is a simple mathematical expression for any given number—the temperatures mentioned are on the Fahrenheit scale), the oil gave off a vapor that was explosive, but at no temperature below this; then it would be a simple affair to say that the limit of safety in using this oil was a temperature of *n* degrees for the body of the oil, and that oils which gave off an explosive vapor at any temperature less than *n* degrees were unsafe for use. Or, let us suppose that the source of danger lay not so much in the temperature of the mass of the oil in a lighted lamp, as in the temperature of minute portions of it in the wick, or upon the vapor tension in the lamp, it would be, in a general way, the same thing as before, but complicated; a mere question of physical experimentation with the natural deductions from the results. The Michigan and New York State Boards of Health have published a few experiments on this subject, and a few similar ones I have recently caused to be made, but neither series is

complete enough to lead to any very conclusive results. It is easy to show that the temperature of the oil in the reservoir of a lamp may be comparatively low, at least below the flashing point of the oil, and yet the lamp be in a dangerous condition. Thus, in one experiment, the whole top of a lamp ignited from its own heat, while the temperature in the reservoir was only 84°, using an oil of 120° flash test. On the other hand, with the same oil burning in a brass lamp, everything was apparently quiet and safe, with the oil reservoir raised to a temperature of 110°. Better to obtain the temperature of various portions of the lamp, I had constructed a metal lamp about five inches in diameter and two and a half inches high, carrying a No. 2 brass collar, surrounding which was a metal air jacket just large enough to admit the bulb of a thermometer, the chambers of the lamp being provided with openings for two thermometers so that the bulb of one was in the oil and that of the other in the air space above the oil. In this experiment nearly all kinds of burners could be fastened and tested with all varieties of oil, and under nearly all conditions that obtain in the ordinary use of oil. A careful and thorough use of some such contrivance as this would materially assist in the solution of the problem. My professional duties have prevented me from making anything but a few preliminary experiments with it, some of which I append to this paper. In order to reconcile the conflicting standards and tests now in use, the subject should be investigated under such auspices that the results obtained will bear the stamp of the highest authority. At present we know that the temperature of the oil in the reservoir of a lamp is not the fact of importance it was once supposed to be, but that the temperature of the metallic burners and collars and of the vapor in contact with them are matters of greater moment. We know that with a chimney broken or removed, a lamp otherwise safe may become dangerous, and we know that the amount of paraffine in an oil may modify the safety of its use. But while we know all this and more, we still lack the systematically organized result of this knowledge. This is what we require, and the necessity of which I am urging. So long as petroleum oils are in general use as illuminating agents, and so long as there are laws regulating their use, it is only proper and right that

these laws should be based upon the unimpeachable results of scientific research.

Outline of Experiments.—Experimental metallic lamp used in all experiments, filled for each experiment with twenty ounces of Astroleum oil "warranted 165° fire test," but which, tested in Foster oil cup, gave 120° F. at its flashing point.

Experiment No. 1.—Duplex burner No. 2, new wicks, etc., burning as brightly as possible, temperature at beginning of experiment: Oil 72°, collar 73°.5; in eleven minutes, oil 73°, collar 98°.5; in seventeen minutes, oil 74°, collar 105°.5; in twenty-one minutes, oil 75°, collar 109°; in twenty-five minutes, oil 76°, collar 110°.4; in thirty-one minutes, oil 77°, collar 112°; in thirty-six minutes, oil 78°, collar 112°; in forty minutes, oil 79°, collar 112°; in forty-six minutes, oil 80°, collar 112°.5; in fifty-eight minutes, oil 82°, collar 112°.5. The chimney of the lamp was then removed. After removal: In one minute, oil 82°, collar 113°.5; in two minutes, oil 82°, collar 115°, with slight explosions about wicks; in three minutes, oil 82°.5, collar 120°, explosions continuing; in four minutes, oil 82°.5, collar 127°, explosions more violent; in five minutes, oil 82°.5, collar 133°, and whole top of burner afire; in six minutes, oil 83°, collar 140°, burner still afire; in seven minutes, oil 83°.5, collar 147°; in eight minutes, oil 84°, collar 150°, and whole top of burner burning briskly, so that the flame was extinguished with difficulty. Four minutes after extinguishing the flame, on inserting a very small gas flame (one quarter inch) in upper thermometer opening, the vapor in the air space ignited and the lamp exploded with some violence, the temperature of the oil at this time being about 84°.

Experiment No. 2.—Venus burner No. 2, with new burner and wicks: Lamp lighted with temperature of oil and collar 69°. In thirty-nine minutes, oil 73°, collar 96°.5. Chimney removed, and in twenty-four minutes the temperature of the collar had risen to 133°.5.

Experiment No. 3.—Miller Sun hinge burner No. 2, new wicks, burner, etc. At beginning of experiment: Oil 79°, collar 81°; in seventeen minutes, oil 80°, collar 98°.5; in twenty-seven minutes, oil 81°, collar 100°. Chimney removed, and in sixty minutes, oil 91°, collar 146°. Lamp extinguished, and on inserting a small gas flame in upper thermometer open-

ing a violent flash was obtained, which blew flame from the opening an inch or more. Four minutes after closing the opening another flash was obtained, but it was faint.

Experiment No. 4.—Mitrailleuse burner No. 2, new burner, wicks, etc., at beginning of experiment: Collar 77°; in forty-two minutes, collar 165°.5. Chimney then removed. In seven minutes, collar 122°, and vapor in lamp flashed when a taper was applied through upper thermometer opening. In twenty minutes the temperature of collar reached its maximum, 138°, and vapor in lamp could still be made to flash by applying a taper.

Additional experiments were made, but no essentially different facts elicited.

INJURIOUS GASES.

By David O'Brine, M.E., M.Sc., M.D., Assistant Professor of Chemistry, Ohio State University, Columbus, O.

It has been beautifully said that the atmosphere gives life to earth, ocean, plants, animals, and men; in and by the atmosphere everything has its being. It is a great ocean, whose waves wash the mountains and the valleys; it clothes the earth every year with a beautiful livery of green; it nourishes the tiny flower and the mighty oak. It is the channel by which deathly pestilence walks forth, and also the sweet perfume descends from the hills. Without it we could not exist, the particle which escapes with our breath takes refuge in a plant, and, after a long but certain journey, returns to us again. Plants and animals are made colaborers in the great scheme of purification, each one using the waste products of the other.

Graham has estimated that if the atmosphere had a uniform density equal to that at the surface of the earth, it would be five miles high. The vapor would form a sheet of water five inches deep, next to this the carbonic anhydride a layer thirteen feet, then a layer of oxygen one mile, and, last of all, a layer of nitrogen four miles: this is but a coarse and imperfect picture of its composition, but it will serve to answer our present purpose.

The first and most important question that concerns us is, How is the atmosphere rendered impure? Some of the impurities are so coarse as to be identified by smell or taste, but, even in this case, in a short time, if the substance remains in the atmosphere the nerves lose their delicacy, while in most cases slight if any warning is given of these atmospheric impurities. Many substances in a fine state of division can be held in suspension in the atmosphere; from the mineral kingdom we may have iron, marble, sand, and alumina; from the animal kingdom the *débris* of living and dead animals; from the vegetable kingdom we have pollen, spores of fungi, mycroderms. We may have emanations that come from rooms inhabited by the sick or by the healthy, from workshops and factories. The impurities with which physicians practising in the city and those practising in the country will meet vary as widely as their localities. City physicians may have air vitiated by respiration, as in crowded workshops, by the products of combustion in lighting and heating factories, by effluvia from sewage or leaky gas-pipes, by vitiation from certain trades or occupations. Country physicians may have the effluvia from marshes and other places of like character; and there will be some impurities in common, as the emanations from graveyards, cesspools, and the sick-room.

The great purifiers of the atmosphere are diffusion, dilution by winds, oxidation, and the fall of rain, by, so to speak, washing out the air.

The air passing into the lungs in the process of respiration is drawn through the mouth and nose, fauces, and air tubes. It is easily seen how readily gaseous substances will enter the blood. The solid particles may lodge in the mouth or nose, or even pass into the lungs, as in the case of stone-cutters, and there decompose or cause irritation. In some cases the particles may be swallowed and pass into the alimentary canal. And it is thought by many that some of the specific poisons, as those which arise from typhoid or cholera evacuations, may produce their first effects not on the lungs or blood, but on the alimentary canal with which they are brought in contact. As a general rule suspended impurities in the atmosphere produce pulmonary diseases. Nearly every trade or occupation has a disease peculiar to it. The miner has bronchitis and

pneumonia, the painter has the painters' colic, the potters have emphysema or "potters' asthma," makers of matches have necrosis of the jaw. While a medical student I attended the post-mortem of a stone-cutter, and was surprised to see the large particles of stone that had found a lodgment in the upper lobe of his right lung. Fumes of metals and poisons, as on wall-paper, may affect those who stay in the room but a few hours. The pollen from the grasses produces, during certain seasons of the year, summer catarrh or hay-fever.

It is admitted by all that certain specific diseases, as scarlet-fever, small-pox, measles, typhus, enteric-fever, plague, yellow-fever, reach the person through the medium of the air. In England some of these diseases have travelled *up* the streams and not *down* as one would suppose, thus showing that the disease was not produced by contaminated water.

Dr. Chandler has shown, in the analysis of the water of the Hudson River at Albany in 1872 and 1885, that sewage, when largely diluted, and travelling the short distance from Troy to Albany, has been purified. The investigations of Hulwa of the water of the river Oder, through the city of Breslau, confirms Dr. Chandler's statement. Contrast, if you please, this statement with the facts shown by Pettenkofer, that diseases have been carried over countries, and leaped over mountains. Liebermeister has shown that most of the scholars in some schools are attacked with typhoid-fever in a succession and intensity corresponding to the degree of their exposure to gases arising from an open sewer. A very interesting case is related by V. Gietl, which shows, at the same time, the long vitality of the typhoid poison. A villager who had contracted typhoid-fever at Ulm returned to her native village, a place where typhoid had not existed for many years. The excrements of this patient were thrown on the dunghill. Several weeks after five persons were employed to remove this dunghill. Of these five four were attacked with typhoid-fever and one with gastric symptoms and swelling of the spleen. The excrements of these five persons were buried in the dunghill. Nine months later two persons were employed in completely removing this dunghill; one of these was attacked with typhoid, and died of it. The case related by "Hammond on Hygiene," page 172, of hospital gangrene in a ward of the

New York City Hospital is equally as instructive. Removal of the furniture and patients did not prevent fresh patients being attacked. Closing the ward for some time and white-washing had no effect. The plastering was then removed and fresh plaster applied, but still cases recurred. At last the entire walls were taken down and rebuilt, and then no more cases occurred.

In this connection it might be stated that epidemics have been caused in France by the opening of old cemeteries. The physician has three principal sources of impure or injurious gases: First, from the leaks of coal-gas, when its odor usually betrays its presence. The average composition of coal-gas is as follows (Nichols): Marsh-gas, 40.0; hydrogen, 34.8; nitrogen, 14.2; carbonic oxide, 7.0; illuminants, 3.4; oxygen, .5; carbonic acid, .1 = 100.0.

The marsh-gas is in the largest proportion, forty per cent; but when we remember that miners work in mines where it is in such proportion that it becomes explosive, when mixed with the atmosphere and ignited, without apparent inconvenience, we can practically disregard it. Hydrogen and nitrogen are rather negatively bad than positively bad. Carbonic oxide is *the* injurious gas. In the blast furnace it is the *reducing* agent that changes the oxide of iron to metallic iron. In the lungs its chemical action is the same, it combines with the oxy-hæmoglobin of the blood and *reduces* it to hæmoglobin. It is the gas that burns with a *blue* flame when the coal-fire is about burned out. It is colorless, and almost odorless, and but slightly soluble in water. Less than one half per cent has produced poisonous symptoms, and more than one per cent is rapidly fatal to animal life. The subjective symptoms are very variable. In fatal cases the breathing is quickened and accomplished with great exertion. The pulse is full and quickened for a time, when it becomes feeble and can scarcely be felt. The temperature falls from 2° to 3°. The body exhibits an unusual resistance to putrefaction. I know of no antidote. Oxygen gas might change it to carbonic anhydride and thereby free it from the blood. It is worthy of a trial. Water-gas is made by passing steam over red-hot coke. When the water is decomposed, hydrogen being liberated, and the oxygen combining with the carbon to form carbonic anhydride

and carbonic oxide, this mixture commingled with naphtha forms the water-gas, and has the following composition (Remsen): Marsh-gas, 21.45; hydrogen, 30.30; nitrogen, 6.85; carbonic oxide, 28.25; illuminants, 12.82; carbonic acid, .3 =99.97.

You will observe it contains about four times as much carbonic oxide and must be many times more dangerous. It has been shown by the experiments of Professors W. T. Sedgwick and W. R. Nichols that the carbonic oxide is the poisonous property of both gases. In the above analysis it is taken for granted that the illuminating gases contain no other injurious gases, which is not always the case. In the burning of these gases the hydrogen forms water and the carbon compounds form carbonic anhydride. The carbonic anhydride given off from the lungs contains dead and decaying animal matter, and is more injurious than the carbonic anhydride given off from a burning lamp.

Sewer-gas.—It has been long noticed that gases resulting from fermentation have little if any odor, while gases resulting from decomposition have invariably a bad odor. These gases tell their own story of their presence. If it were the injurious gases only it would not be so bad, but it is the disease germs they contain that make them so dangerous. "An ounce of prevention is worth a pound of cure." Ambroise Paré has most happily said: "I dressed his wound and God healed it." Whatever may be the province of the physician, the province of the sanitarian is to *prevent* diseases and not to cure them. How these injurious gases can be prevented from entering our rooms is shown by a few experiments a little further on. The last source of injurious gases comes from the emanations from the patients and the disease germs that they contain. How can we best remove this source of danger? By disinfecting the discharges, by covering them with a solution containing ten pounds of sulphate of iron and half a pint of carbolic acid to every five gallons of water, and then having them properly buried *beyond every avenue of contamination.* Special attention should also be given to disinfecting the clothing before it is washed, and the room, by burning about one pound of sulphur to every one hundred cubic feet of space the room contains, and keeping it closed for five or six hours.

The ventilation of the room may be accomplished in two ways: an artificial ventilation, which belongs to the architect in the constructing of your dwellings, and a natural ventilation due to the porosity of the materials of which your buildings are constructed. This last point I want *especially* to emphasize, as it is from this source that gases from leaky gas and sewer-pipes enter dwellings. The natural ventilation is produced by three principal forces: diffusion, winds, and the unequal temperatures between the inside and outside of the building causing differences in the weight of the masses of air. The rate of diffusion of a gas is inversely as the square root of its density. The action of the wind is a very important ventilating agent. I have here a medium-grained sandstone known as "Berea grit;" it is two inches thick and eight inches square. I have varnished the edges to prevent the escape of air, and have covered it with sheet rubber, leaving a hole in the centre of each sheet of rubber two inches square. I have clamps on each side connected with gas-pipe; by making these air-tight I can blow a candle out at the other end of the tube, thus showing you I can blow through two inches of solid sandstone.

The quantity of air passing through a porous building material is directly proportional to its constant of permeability, and to the difference in atmospheric pressure upon the two sides; it is inversely proportional to the thickness of the wall.

The permeability of building material is shown in the following table taken from Lang:

Material.	*Constant of Permeability.*	*Material.*	*Constant of Permeability.*
Calcareous tufa	7.980	Portland cement	.137
Slag from Haardt	7.597	Machine brick	.132
" " Zuffenhausen	5.514	Green sandstone, Upper Bavaria	.130
" " England	2.633	Green sandstone, Switzerland	.118
Cendrin stone	1.327	Oakwood	.007
Pine wood	1.010	Clinker, glazed, impermeable	.000
Mortar	.907		
Brick	.383		
Beton	.258		
Clinker, unglazed	.145		

Painting and papering the walls reduce very materially the

amount of air that can pass through them. I will fix up my sandstone in a little different manner by putting a cork and glass tube at one end and connecting the other with the gas; after a few minutes I will light it; now you can see it burn at the other end. I have made some experiments to show the amount of pressure required to force the gas through the sandstone; a pressure of two inches of water will force it through as you see it. To satisfy any "doubting Thomas" I take it apart and again put it together (as described). I have here in this tube (Exhibit *d*) two and a half inches of a mixture of equal parts of lime and cement as usually made. I have dried it, and, as you see, can blow through it quite readily. This is the material the plumbers would use to lute the joints in sewer-pipe and the like. I have another experiment to show how gases from the earth, from graveyards, sewers, cesspools, and other putrefactive material, even when buried to a considerable depth, can by the simple action of the wind by blowing over the place be brought to the surface. My tube is six feet long, drawn out at one end and turned up; this end is connected with a smaller tube going up along the large one, and the smaller tube at the upper end is bent upon itself, forming a U or manometer tube, and is filled with a solution of indigo so as to indicate any change of pressure; by blowing across the tube containing the sand, pressure is indicated by the manometer tube, thus showing that I can blow through six feet of sand very easily; and I am no politician either. That this is not transmitted pressure I have proven by blowing bromine vapor through the sand and testing it at the other end.

PTOMAÏNES AND POISONING BY TAINTED FOODS.

By J. U. Barnhill, M.D., Assistant in Materia Medica and Lecturer on Toxicology, Columbus Medical College, Columbus, O.

The advantages of exact knowledge concerning the formation of poisons in articles of food and in the human organism justify the prominence that has recently been given to this subject. Admitting that "it has always been known that de-

composed meat was poisonous," this knowledge was too indefinite to be of much practical utility to the sanitarian or toxicologist. Not until very recently has scientific research succeeded in revealing the nature of this poison and its mode of action, phenomena hitherto among the most obscure in the domain of toxicology. By contending with an enemy long enough, it has been said, we may discover his modes of warfare. In the discovery of the ptomaïnes of putrefaction the enemy has been dislodged from ambush, and experimentation has revealed his modes of action. May we not reasonably expect that further inquiry shall bring to light means of measurably staying his destructive hand?

1. *History.*—As early as 1853 Schlosbarger announced the discovery of organic substances in the products of decomposition, and a little later Marquardt separated a base which he named septicin. In 1877 Francesco Selmi, an Italian physician, in examining two exumed corpses for arsenical poisoning, discovered in the partially decomposed stomachs organic bases, giving the reactions of alkaloids, to which he gave the name ptomaïnes—$\pi\tau\omega\mu\alpha$, a corpse—or *alcaloides cadaverici.*[1]

2. *Formation.*—Their genesis is imperfectly understood. They are found in the products of fermentation and putrefaction, processes which are the result of the action of organized ferments. Putrefaction is supposed to begin either with hydrolysis and the consequent disturbance of chemical affinities, or in the disoxidizing power of micro-organisms, and to result in the formation of various gases and waste products, among which are these cadaveric alkaloids. While molecular affinities are thus disturbed, it has been thought that ptomaïnes may occur by synthesis as coniïne may be formed by the action of ammonia on butyric acid, with the separation of water, thus: $2\,C_4H_8O_2+NH_3-2H_2O=C_8H_{15}N$, coniïne. It seems not improbable, however, that these ptomaïnes are the analogues of the vegetable alkaloids, the products of cellular organisms. Professor A. V. Poehl, of St. Petersburg, says "that the formation of ptomaïnes in nature is mostly caused by the vital action of micro-organisms."[2] "He succeeded in demonstrating the reducing power of certain organized ferments on the surrounding nutritive medium during their

growth," holding that ptomaïnes are the products of the disoxidation or reducing power of microbes. The cell, as the basis of organic life, produces formed material and waste products, and waste products, animal or vegetable, may be poisonous. Torula cerevisiæ, in the process of growth, decomposes sugar and forms alcohol and carbonic acid ; mycodernia vini changes alcohol into acetic acid ; bacillus myolobacter produces butyric fermentation. These and many other forms of organized ferments take part in the process of putrefaction, the products of which are many and illy defined.

As animal cells elaborate carbonic acid, urea, etc., and plant cells the vegetable alkaloids, we infer that the bacterial cells—the micro-organisms of putrefaction—by excretion, disoxidation, or otherwise, elaborate the cadaveric alkaloids. Ptomaïnes, formed under the influence of bacterial life, should not be confounded with leucomaïnes, "animal alkaloids," which are formed under the influence of vital force by the metamorphosis of tissue.

S. Brieger,[3] of Berlin, found in the putrefaction of albuminoids an alkaloid which he named peptotoxine. From other putrid substances he extracted ptomaïnes to which he gave specific names, and for some of them determined the chemical composition. His list includes neuridine, neurine, musearine, gadinine, ethylene diamine, triethyamine, di- and tri-methylamine and gelatine. Professor V. C. Vaughan, of the University of Michigan, extracted an alkaloid from decomposed cheese to which he gave the name of tyrotoxicon.[4] Other chemists have since isolated the same ptomaïne from poisonous cheese and ice cream. Professor J. H. Long, of Chicago, extracted an alkaloidal substance from the beef which caused the poisoning at Momence, Ill., and Professor D. O'Brine, of the Ohio State University, extracted a ptomaïne about three years ago from a cadaver, and has since, on several occasions, found ptomaïnes in poisonous foods. Sonnenschein found morphological bases in patients dying of typhoid-fever, and Selmi found in the urine of a patient suffering from progressive paralysis two ptomaïnes, resembling respectively conïne and nicotïne. They have been found in patients suffering with various other diseases.

3. *Properties.*—Professor Selmi[5] gives the chemical reactions

of at least nine isolated ptomaïnes, one of which has the physical properties of coniïne and the physiological and toxic action of curare ; others resemble respectively atropine, strychnine, morphine, veratrine, coniïne and delphinine. Chemically they are amines, volatile, fixed ; crystalline, amorphous ; solid, fluid ; inocuous, antidotal and virulently poisonous ; varying also in color and in certain chemical reactions. Tyrotoxicon is crystalline, has a pungent odor, and causes a sharp burning sensation on the tongue. The sulphates of ptomaïnes extracted from the "head cheese" which caused poisoning in this city a year ago, and from the Mansfield dried beef, presented vesicular crystals and had a peculiar odor, an intensely bitter taste, and a benumbing action on the tongue.

4. *Actions.*—Gautier, at the Acad. de Med., presented a pure oily ptomaïne, one mgrm. of which injected subcutaneously killed a bird in thirty minutes. Professor Vaughan, with tyrotoxicon, experimented upon cats, and found it caused retching, vomiting, and in one case death. A crystalline alkaloid injected subcutaneously killed a rabbit in two minutes, having produced tetanic convulsions. An amorphous ptomaïne similarly administered to a rabbit produced retching, mydriasis, convulsions and death in two and a half hours. In eighteen experiments on frogs death occurred with the heart in systolic standstill. A. Villiers, in experimenting on guinea-pigs, found that a small quantity of a weak solution of a ptomaïne produced marked variation of the heart's action, incoordination and violent trembling in forty-five minutes, and death in four days. Professor Ciaccio, in experimenting upon frogs, noted as the most prominent symptoms gastro-intestinal irritability, torpor paralysis, and systolic inactivity. It has been determined that ptomaïnes of different physiological action and of varying degrees of toxicity are produced at different stages of decomposition. As the result of experimentation, Professor Panum[6] states that there exists in putrid fluid, after the micro-organisms have been removed, a *specific chemical substance* capable, when introduced into the circulation, of producing that peculiar group of symptoms which are recognized as those of *septic infection.* Ptomaïnes extracted from culture fluids of the cholera bacillus "will produce all the phenomena of cholera."[7] Portions of the sausage which

caused the fatal poisoning at Arlford, England, in 1881, were fed to twelve mice and four rabbits. Soon after feeding the animals became ill, refused food, vomited, and died at varying intervals from one to several days. The *post-mortem appearances* were, in a high degree, indicative of the action of some chemical poison. The urinary tubules contained casts, many malpighian bodies, and the tissues surrounding them were in a state of disintegration due to some *destructive agency* acting in the glomeruli. The sudden illness after feeding, the vomiting, and the condition of the kidneys, are just such as are compatible only with that assumption, and as the report shows Dr. Dupré did extract a ptomaïne from the sausage.

Many similar cases might be cited, but the foregoing are sufficient to show that the chief destructive agents in putrescent foods are ptomaïnes; other products may by their presence aid in producing the gastro-intestinal irritation, but the actions of the ptomaïnes alone explain the *neurotic* and *structural changes* that often accompany food poisoning. Since ptomaïnes are found during the progress of various diseases it seems not improbable that they are the chief factors in numerous morbid processes, and that disease may be sustained by auto-intoxication from ptomaïnes elaborated within the system.

Cases of Food Poisoning.

By personal communication and from reported cases I have collected the following instances which may illustrate the source and character of this kind of poisoning. Seven cases communicated by Dr. W. B. Guthrie occurred at Gallipolis, May 14th, 1886, from partaking of putrid ham which was served in sandwiches at a restaurant. Vomiting, purging, great prostration, cold sweat, and pinched, cadaverous features, were the prominent symptoms. The ejected meat had a peculiar pinkish tinge. All recovered.

Five cases by Dr. R. Harvey Reed, of Mansfield, of poisoning from eating chipped dried beef which occurred in his practice.[8] (*Journal of the American Medical Association* for February 19th, 1887.) The symptoms were vomiting, purging, twitching, cold extremities, extreme prostration, and accelerated pulse. All recovered in ten days or a fortnight, but were troubled more or less with indigestion and constipation

for some time after other symptoms disappeared. Ptomaïnes, as already mentioned, were found in this meat, and a microscopical examination by Dr. A. J. Leech, of Columbus, revealed an abundance of micrococci and a granular infiltration of the muscular fibre of the meat.

Two cases of poisoning from putrid cheese have been reported by Dr. G. C. Ashmun, of Cleveland. A husband and wife, Polanders, were in the habit of gathering up the refuse material about a meat market in the vicinity of their home, and from a piece of cheese thus secured they were both poisoned May 20th, 1886. The most noted symptom was a persistent diarrhœa, which could not be controlled. In eight days the wife died. No autopsy was held.[9]

Recently a family near Loudenville, Ashland County, consisting of five members, was poisoned by putrid sausage, and one case proved fatal.[10]

In the April issue of the *Cleveland Medical Gazette*, the writer reported eight cases of poisoning from "head cheese," which occurred about a year ago in this city. Eight members of the family who had partaken of cold "head cheese" were attacked, in from ten to eighteen hours after the repast, with vomiting, "burning" sensation in stomach, purging, prostration, subsultus, emprosthotonos, dry mouth, and disturbed vision. There was a disturbed temperature—usually above normal—lasting in most instances for two and in one case for more than three weeks. The head cheese was manufactured by a well-known firm of this city. Portions of it were secured from the butcher who sold it to the family. It had a bad odor, soft, greasy appearance, and acid reaction, was permeated with micro-organisms of decomposition, and, as was reported by Professor H. J. Detmers, of the Ohio State University, the muscular fibres were in a state of disintegration. Professor D. O'Brine made an exhaustive analysis of the material. He used, with some modification, the Otto-Stas method of extraction, and succeeded in securing from small quantities of the material ptomaïnes in appreciable quantities. They responded to the tests for cadaveric alkaloids, one of which was the ferro-cyanide of potassium test of Bronordel and Boutmy, which is considered the best means for distinguishing ptomaïnes from vegetable alkaloids. The small quantity of

material at our command rendered experimentation impossible.

Three cases of poisoning from eating pork sausage, communicated by Dr. J. Barker, of Castorville, Cal., occurred in a Swiss family consisting of husband, wife, and hired man. The symptoms were mostly those of gastro-intestinal irritation. The wife, who grew rapidly worse, suffered from most persistent emesis, cold extremities and imperceptible pulse, and died about five days after the appearance of the nausea. The husband was sick for two months, but entirely recovered. A careful inspection of the cooking utensils and other articles of food failed to find any other cause for the illness than the sausage.

In a charitable institution at Denver, Col., all the inmates—twenty in number—were poisoned by eating "sausage meat." The symptoms were those of irritant poisoning.[11]

Four cases of poisoning from canned salmon occurred in September, 1885, at Davenport, Ia., the symptoms simulating arsenical poisoning. The material was submitted to Dr. W. Jepson, of Oakland, Neb., for examination, who found the material "teeming with bacteria" and emitting an odor characteristic of decomposition. Chemical tests for metals revealed only traces of lead and tin. It should be added that the salmon-can had been opened and stood in a warm kitchen during the previous night.

Two cases of poisoning from canned corned beef occurred in the practice of Dr. E. Chenery, of Boston, Mass., in November, 1882. The symptoms were those of an irritant chemical poison. The beef had a black-looking mass near the centre, which was thrown away; the rest had an unpleasant taste.

In November last, at Bucyrus, four persons in one family were poisoned by eating veal. The symptoms were similar to those already related.[12]

Thirteen Hungarian laborers in the Drifton mines at Wilkesbarre, Pa., in July, 1881, were poisoned from eating Bologna sausage, and five died.

At Arlford,[13] England, in March, 1881, a gardener was fatally poisoned by eating a half pound of imported German sausage. The suddenness and violence of the attack indicated the action of a chemical poison. It was with this sausage that the experiments upon mice and rabbits, already referred to,

were made, and it has been mentioned that a ptomaïne was separated from it by Dr. Dupré. While this unfortunate gardener was suffering from the effects of the poison, which produced pain in the chest and cough, a medical man who saw him pronounced it bronchitis. Professor Blyth says: "This case affords painful suspicion that not a few of the cases of pneumonia returned from the country districts may not be pneumonia, but the result of poisoning; for this case would certainly be returned as death from some respiratory affection." This remark makes us reflect that the very few cases of such poisoning reported in this country may be due to the fact that they are wrongly reported, or not reported at all.

In August, 1885, at Momence, Ill.,[14] thirty-seven persons were poisoned from eating certain dried beef. Toxic symptoms began to develop in from two to eight hours after the ingestion of the poisonous material; the symptoms, as reported by a resident physician, Dr. H. W. Keyser, were vomiting, purging, cramps, and burning sensation in epigastrium. One case resulted fatally on the fourth day of her illness. Some of the parties noticed a distinctly bitter taste about the meat. In one instance the beef was fried before being eaten, but the symptoms were the same as in the other cases. This is a significant fact, since it tends to prove that the poisoning is produced by these chemical bases, and to confirm many other observations already cited that they are capable of producing the toxic symptoms of putrid meat poisoning when separated from the micro-organisms which produce them. The temperature of frying meat would destroy ferments, but might not destroy the ptomaïnes, as they were not destroyed, evidently, in this case. From this meat a ptomaïne which has already been described was extracted by Professor J. H. Long, analytical chemist for the Illinois State Board of Health, and under the microscope an abundance of micro-organisms were found. The meat had a peculiar odor, a bitter taste, and a "lack of firmness in the fibres," which were in a state of disintegration.

Four cases of poisoning from putrid ham occurred at Prescott, Ark., in April, 1884. In addition to the gastro-intestinal irritation, there was, says Dr. Hinton, who reports the case, for four or five days almost constant fever and furred tongue.

An interesting case of poisoning by a rotten egg is reported by Bronordel and Boutmy.[15] It illustrates the possibilities

of putrefaction in elaborating toxic agents from limited material. A woman and two men, while intoxicated, shared, during a repast, of a rare morsel, in the shape of a rotten egg, which is said to have had the odor of mice. The woman died as the result of the poisoning, while the other two parties recovered from their induced sickness. On post-mortem they found in the viscera of the woman a ptomaïne which killed frogs, and was the same as one extracted from the egg. The symptoms were not those of alcoholism.

Poisoning from cheese, ice cream, and milk has been comparatively frequent. Since the exhaustive investigation of the three hundred or more cases of such poisoni g that came before the Michigan Board of Health, many other cases have been reported and made the subject of investigation.

The properties and action of tyrotoxicon have already been described. In the cases of poisoning referred to, the prominent symptoms were retching, vomiting, purging, dryness and constriction of the fauces, cramps, backache, pain in stomach, headache, and tendency to sleep.

More than a hundred persons were poisoned by ice cream furnished by one restaurant in Brooklyn, N. Y., in 1885.[16] As no mineral poison could be found by the chemist, it was thought that poisonous principles were developed in the decomposed gelatine which was used.

In August, 1886, some sixty persons at different hotels at Long Branch were seized with toxic symptoms soon after eating. In from one to four hours after the meal toxic symptoms developed; they were gastro-intestinal irritation, nausea, vomiting, cramps and collapse. Dryness of the throat and gastralgia were prominent symptoms. The analysts, Dr. W. K. Newton and Mr. Shippen Wallace, in their report[17] of these cases say: "We are justified in assuming, after a full investigation of all the facts, that the sickness at Long Branch was caused by poisonous milk, and that the toxic material was tyrotoxicon. A portion of this tyrotoxicon was fed to a cat, which was soon seized with retching and vomiting, and soon in a condition of collapse, from which it recovered in a few hours. The production of this substance was no doubt due to the long time which elapsed between the milking and the cooling of the milk, the latter not being attended to until the milk was delivered to the hotel, having been hauled six miles

through the heat of the day, during which time fermentation had begun, and the poisonous material, tyrotoxicon, was produced."

[At a festival about eighty young ladies of Ohio Wesleyan University, Delaware, were poisoned by ice cream. The symptoms were such as have already been described in connection with ice cream poisoning. Reported by Professor E. T. Nelson in the discussion of this paper.]

Professor Vaughan and others have called attention tc the fact that cholera-infantum and summer diarrhœa may be due to the action of tyrotoxicon, produced by fermentation in milk foods. It is a matter of common observation that children nourished at the breast are not so liable to these affections as those that are fed on mixed foods and cows' milk, and for the reason, as pointed out by Dr. Kinsman in his paper on "Intestinal Antisepsis,"[18] that "there are no bacilli in the intestines of children fed at the mother's breast, hence no chance for fermentation and consequent poisoning from the products of fermentation." Cholera-infantum and diarrhœa are often induced by the ingestion of fermented fruit. Dr. R. Harvey Reed,[8] in a paper already referred to, says that "The majority of cases of cheese-poisoning are produced from porous cheese." Manufacturers allow the curd to stand until it begins to ferment and render the cheese light and porous. It is rationally inferred that the development of these poisonous alkaloids is due to this overfermentation either before or after being pressed.

Poisoning from canned fruits and other articles of food has been quite frequent. The poisoning has usually, or, at least, frequently been attributed to lead, tin, copper, or some other metal, salts of which were thought to have been formed by the action of the acids of fermentation upon the cans. But the statement of Dr. T. Stevenson, of London, may set our minds at rest on this suspicion. He says, in a paper on "Poisoning by Canned Food," read before the Medico-Legal Society of New York: "Acute *metallic poisoning* by canned provisions is not known to have certainly occurred in this country. I have been Government Toxicological Analyst for thirteen years, and have never met with acute metallic poisoning by canned foods. The toxic symptoms from eating canned foods

are identical with those produced by the putrefactive alkaloids. When, therefore, sudden illness occurs after a repast on canned foods it may ordinarily be attributed to ptomaïnes poisoning. Of course it may be due to poison accidentally or intentionally introduced into the food."

Poisoning from decomposed meat has been most frequent in countries where large quantities of Bologna sausage, the so-called puddings, and head cheese, are used, notably in the rural districts of Germany. Foreign and unsuitable sustances, as milk, meal, brains, onions, fat and blood put into these foods encourage decomposition. They are often improperly prepared, and often put up in thick-walled receptacles—as pigs' stomachs—which prevents proper "curing." Putrefaction usually begins near the centre of the mass, which has a bad odor, grayish-green color, greasy, soft appearance, and is acid in reaction. Broiled ham put into "sandwiches," dried beef covered with fungi, imperfectly canned fruits, and meats of various kinds, and ice cream and cheese prepared from material in which ferments have begun their work, are frequent sources of food poisoning. Among children the various diseases induced by tainted fruits and mixed foods, sour milk, and bacteria from unclean nursery bottles, claim annually unnumbered victims.

In conclusion we think the following summary, which embraces the leading ideas of this paper, may be found at least to approximate the truth on these as yet unsettled but interesting questions:

1. Fermentation and putrefaction are the results of the action of organized ferments.

2. Ptomaïnes are products of fermentation and putrefaction, either by synthesis or by the reducing or elaborating power of micro-organisms.

3. Ptomaïnes represent the chief toxic principles of decomposed albuminous substances. Other products might and do produce gastro-intestinal irritation, but no other substance, except the cadaveric alkaloids, has been found capable of producing all the symptoms of putrid meat poisoning.

4. They may be elaborated within the system as well as without wherever organized ferments flourish, and as organized ferments as well as these poisonous ptomaïnes have been found within the system in various diseases and morbid proc-

esses, we infer that they may have an etiological relation to these diseases. But as this phase of the subject is foreign to the purpose of this paper, I have omitted all discussion of it.

5. Poisoning from putrid meat is more liable to be long continued than poisoning from ptomaïnes. In the first instance the ptomaïnes, being introduced into the stomach along with the micro-organisms and putrid material, continue to be elaborated within the system and maintain a succession of poisonous effects, until possibly the tissues of the body give way to the destructive agency of the chemical poison. Thus it seems probable that cholera-infantum, cholera-morbus, and simple cholera are caused by the ingestion of fermented foods, and the subsequent auto-intoxication by the action of poisonous alkaloids elaborated within the system.

The light that has already been thrown upon the subject by recent investigation is of great advantage to the sanitarian and to the physician. It may aid in the education of public opinion to a better understanding of the sources and dangers of impure and tainted foods, and of the means by which uncleanliness, adulterations, and decomposition may be detected, and it may lead to the discovery of better means of preserving articles of food.

(1) Chemical News, June 2d, 1882. (2) Journal American Medical Association, January 8th, 1887, page 38. (3) Medical Record, November 21st, 1885. (4) Report of the Michigan State Board of Health, 1885. (5) Blyth on Poisons, and London Lancet, November, 1883. (6) British Medical Journal. (7) Intestinal Antisepsis, Professor D. N. Kinsman, Journal American Medical Association, June, 1886. (8) Journal American Medical Association (forthcoming), February 19th, 1887. (9) Cleveland Medical Gazette, June 5th, 1886. (10) Loudonville Star. (11) Reported by Dr. E. J. A. Rogers, of Denver, Col. (12) Reported by Dr. J. A. Chesney, of Bucyrus, O. (13) Blyth on Poisons. (14) Annual Report Illinois State Board of Health, 1885. (15) Archives Generales de Medicine, Vol. II., 1884. (16) Report of Brooklyn Board of Health, 1885. (17) Philadelphia Medical News, September 25th, 1886. (18) Journal American Medical Association, June, 1886.

CARE OF THE CHRONIC INSANE IN OHIO.

By F. H. Darby, M.D., Chairman of Sanitary Committee, Morrow, O.

"What shall be done with this class of unfortunates?" is a question which now more than ever before engages the attention of public charities. Were we at the beginning of a new state, we might, in the broad light of this the nineteenth

century, adopt a plan somewhat different from that herein advocated.

Circumstances, however, alter cases. We are advanced to the dignity of an older State. We are donning our regalia for a centennial celebration. We already possess fine properties appropriated to the care of the insane. Corps of trained specialists are doing good work in carrying out this noble charity. We say noble, because with us it means more than in most States. It is one of our boasts that we care for *all* our insane. Having set out to do so, let us do it. Such being the wish and will of the founders of our institutions, let us execute that will in a way that shall be creditable to ourselves and the pride of our posterity. That we are doing well so far as we have gone we presume none will deny. That we must soon go further and do more is equally undeniable. Need we narrate to the intelligent people of Ohio the horrifying story of the jail and infirmary care, or, rather, lack of care, of our chronic insane? Are they not already familiar with it? Does not almost every county furnish melancholy examples? Is not every State and county official and every legislator from the lake to the river fully apprised of the sickening details? The lay papers of the State are daily reciting these outrageous scandals.

There are now in jails, infirmaries, and private families about 2500 practically *un*cared for. That they should receive State care is admitted by all. How to administer it is a question about which there is a difference of opinion; meantime, tax-payers stand aloof, humanitarians are shocked, and the poor unfortunates, bereft of friends and reason, continue to suffer. Our asylums are full, and recent cases—those most amenable to treatment—are frequently compelled to wait from a week to a month before admission. The rapidly increasing insane population is thus augmented. During detention in jail or the mad-house of an infirmary, the time for successful treatment passes, while the terrifying associations often aggravate and carry the case permanently beyond the stage of curability. Under such circumstances what becomes the first duty of a people charged with the important trust of *caring for all?*

It is manifestly to act—to act through our legislative

authorities for the enactment of practical measures. It would be of no avail in this connection to discuss the boarding-out system now practised in Massachusetts, the collection of the chronic insane in a great central asylum as at Willard, N. Y., or the county system in Wisconsin ; plans all very well in their respective localities, but not applicable to us. We have not started in any of these directions. The Ohio laws are adapted to a different system. But as the "trade does not make the man," so the system does not make the care. *Efficiency* and *sufficiency* are indispensable, whatever may be the system. The former we have, the latter we have not.

Much might be said in favor of the various systems practised in our sister States and European countries. But at the risk of being considered old-fogyish, we assert, fearless of successful contradiction, that for us here in Ohio, the present system of State care in district asylums is the very best. It is so good that we cannot now afford to change it. Change is not necessarily reform. What we want is *more* districts, *more* asylums, and *some* classification. Experience has demonstrated that in asylum buildings we must avoid extremes. On the one hand, the departments or annexes to our county infirmaries are too small for economy in *per capita* cost of both construction and maintenance. On the other hand, Willard's would be too large. Our own State institutions are too large. Good hygienic conditions are the essential *desiderata* of asylum life.

These *can* be economically obtained in institutions of from 400 to 500 capacity. Instead, then, of constructing annexes to existing asylums, new ones ought to be built. The aggregation of large numbers, as now practised in our cities, frequently give rise to unsanitary conditions, which are sometimes insurmountable. Large State institutions, however well located and managed, are open to the same objections. Another reason for more and smaller asylums is that the inmates may be within easier visiting distance of friends and relatives.

A glance at the geography of the State shows that the people of Eastern Ohio are justly entitled to an asylum. The erection of *two* asylums on the pavilion plan, for the better treatment and care of the epileptic insane, ought to engage the attention of the authorities after the completion of the

Toledo institution. Chillicothe and Mansfield, geographically, are eligible sites. More room may thus be made in existing asylums for curable cases. Much might be said in favor of separate provision for this class of insane, with special reference to appliances promotive of self-support. Hence the, at first, apparently extravagant proposition to have "*two*" institutions, so that at least three acres of land to each inmate able to work could be the more conveniently procured. Employment at trades, as is the practice in European institutions, does not meet our wants nearly so well as the more congenial agricultural pursuits. Here, where land is still cheap, every facility ought to be afforded to those who can work to do so. In asylum life, as elsewhere, idleness begets mischief; pent-up energies must have vent; restive bodies must have exercise; properly directed occupation becomes the handmaiden of non-restraint, and is at once beneficial to the patient and profitable to the State.

"But," says the political economist, "it costs money to build and maintain these institutions." . . . "We are just completing a large one at Toledo which will afford partial relief." True, but it is this "partial relief" system, or rather lack of system, against which we remonstrate. A careful estimate by competent statisticians shows that upon the completion and filling up of the new Toledo asylum there will yet remain uncared for by the State about 1450 of the class under consideration. We regret that this should be thus, but figures will not lie, and this calculation has been made with a strict regard for truth. It will cost something to make sufficient provision for this lamentable state of affairs, but it will cost more not to make it. County care costs the tax-payers more than State care, and with our present limited and defective accommodations is, as a rule, a most disgraceful failure.

The Legislature of Ohio could not more fittingly celebrate the hundredth anniversary of the first settlement of the State than by making this humane classification and provision. The present practice is both a false economy and a false philanthropy.

The world, we are aware, was not made in a day, but the charitable institutions of a well-regulated State like Ohio ought to be set in order in less than a century. The Bedlam of

voices from "minds dethroned," in nearly every infirmary and many of the jails of the State, cry aloud to the Legislature for a redress of grievances. The pitiable condition of these unfortunates is such as to suggest the idea that the State had adopted a policy of extermination. In saying this we cast no reflection on infirmary and jail officials, for usually they do all in their power to ameliorate the deplorable condition of their dependents. The fault is with legislators, who have not the courage of their convictions to do right, but are ambitious to be dubbed "watch-dogs of the treasury," who suffer themselves to be influenced by the plaudits of an occasional picayune constituent, devoid of the milk of human kindness, like Esau of old, who sold his birthright for a mess of pottage. The Legislature should be deaf to such narrow-minded selfishness and prove itself equal to the task of righting so great a wrong. It should, in the interest of humanity, rise above sordid considerations and see to it that the most sanguine dreams of our revered ancestral philanthropists are more than realized; not in palatial edifices bedecked in glittering finials, Corinthian columns, and Catharine-wheel windows, but in the erection of an adequate number of conveniently arranged asylums suggestive of the home rather than the prison.

SOME OF THE PRACTICAL RESULTS OF OUR CRIMINAL LAWS FROM A SANITARY STANDPOINT.

By R. Harvey Reed, M.D., Mansfield, O.

It is simply appalling to read the daily records of crimes committed throughout our country, and almost terrifying to compare the convictions for crime with the number of crimes committed.

What safety is there to the general public when persons are murdered by desperadoes for a few dollars, or shot down for only aiding in an effort to secure justice?

When cars are invaded and their passengers robbed, express messengers shot, and safes plundered, when officers are mobbed and murdered by desperadoes for doing their duty, as in the case of a train recently, which was invaded, and

a poll forcibly taken from the officers in charge at the peril of human life ; when even a President's life is threatened for not complying with the desires of some crazy office-seeker—pray, what does all this lawlessness mean ?

It means that the practical results of our criminal laws are not what they ought to be.

Only a few days ago a newspaper published the following proportion of arrests for assault and battery in thirteen of our leading cities, to their whole number of inhabitants :

Cincinnati,	one for every	4,476	New York,	one for every	196
Columbus,	"	2,466	Buffalo,	"	174
Providence,	"	582	Boston,	"	133
Chicago,	"	504	Albany,	"	116
Philadelphia,	"	292	Baltimore,	"	103
Brooklyn,	"	257	Washington,	"	69
Springfield,	"	228			

Crime is largely induced by two leading factors, selfishness on the one hand, and the possibilities of escape from justice on the other. The former may exist in a variety of forms, and be induced by a multiplicity of circumstances ; but the latter is dependent largely on the perfection of our criminal laws and their execution.

The New York *Independent* has at different times taken strong grounds that "lynch law" should be forcibly suppressed by the prompt and fearless execution on the scaffold of any person connected with its deplorable practice ; but, much as we despise the principles and practice of "lynch law," we do not believe the course advised by the *Independent* would either be practicable or advisable.

Just as long as criminals who are guilty of capital crimes are not only protected by the wily constructions placed on legal technicalities, and their merited punishment delayed for months and years at an enormous expense to the honest, law-abiding tax-payer, but even acquitted through a fixed or sympathetic jury, or by the scheming shrewdness of some criminal lawyer, just so long may we expect prompt justice to be sought by an exasperated and abused community through the powers of the "lynch law."

Let a murder be committed in a community, and at first

every paper "in the region round about" joins in denouncing the scoundrel murderer and recommends his prompt execution; but time rolls on; even if captured and placed in the hands of the law, he must be given a preliminary hearing and "bound over," if supposed guilty; then he lies around in jail month in and month out at public expense. Time after time the case is called and postponed, because somebody who is supposed to be an important witness in the case is away, or sick; or a dozen other excuses are raised to delay prompt justice, for well do our legal brethren know the value of public sympathy, and the frailty of human nature and loss of memory, which are nourished by delay, all of which adds to the criminal's chances for escape; meanwhile, sympathetic interviews are held and published, and the once-despised desperado becomes the champion of the hour, while all the horrors of his atrocious crime are dimmed by time and painted with sympathy, until the innocent blood that once stained the floor of a happy home is almost forgotten, and the widow and fatherless children, who appear as prosecutors praying but for simple justice, are even looked upon as his persecutors.

How many murderers can we count on our finger-ends who have thus escaped their just doom, and are running at large to-day or will soon have paid the paltry penalty imposed on them in the State's prison, or be pardoned by a sympathetic governor and let loose to return as the hero of a sensational tragedy?

Only a few days ago I was told by a medical friend from a well-known city in the central part of this State of just such a case, where a man who had deliberately committed a prearranged diabolical murder and accomplished his end, was tried after the usual delay of law and acquitted, and is running at large to-day in defiance of our law.

Of all the cases that have been tried in our county for murder, only one has been found guilty, and had justice measured out to him. But our county is not the exception. I dare say there are few counties in the State that cannot, if they will, "rake up" similar records in their court proceedings in criminal cases.

We have thus far only been discussing some of the practical results of our criminal laws as they affect criminals who have

been captured ; but how do they affect the criminal who is still at large and *assist* in his capture ?

All that is necessary to prove that they are not what they should be is for each of us to go back for a moment to our own and neighboring counties, and count *again* on our finger-ends the murderers who have committed their foul deeds and escaped unpunished ; yea, even without fear of apprehension.

It is reported on good authority, and I blush to repeat it, that a score of murders have been counted in Richland County alone with but one arrest and conviction, several of which have occurred within the last few years, and *every one* without the detection or the arrest of the murderer ; yet I know Richland County, while bad enough, does not stand alone on the black list of the criminal records of capital crimes.

What effect have our present criminal laws on the prevention of abortion ?

What percentage of practised abortionists are ever condemned and found guilty of infanticide when tried, of the whole, who are annually, and almost defiantly pursuing their foul and murderous occupation for the gain thereof ?

In an editorial by Dr. Baldwin, of Columbus, O., in the Columbus *Medical Journal,* Vol. II., page 573, under the title " Is Conviction for Abortion Possible in Ohio ?" he says : " Three cases, which have recently occurred in the city, have resulted so disastrously for the State, that physicians, it would seem, need no longer be deterred from producing abortions by any fears of legal prosecution. Moral motives may restrain them, or the fear of something after death, but they need not fear the law, while public sentiment has long since ceased to condemn, except under very aggravating circumstances."

In this same editorial the doctor goes on to say, " Four years ago a doctor in this city was arrested on complaint of a young woman on the charge of having produced an abortion on her." The doctor lay in jail all summer, being unable to furnish $500 bail. At the end of this time, when his case came for hearing, his victim . . . " refused to appear against him, and he was discharged."

" Three years ago," he says, " a married woman, a few hours before her death, made a dying declaration, in the presence of her two physicians, the prosecuting attorney, and others,

in which she charged a certain doctor with having produced an abortion on her, and described with the minutest detail her visit to his office, which she made alone, and his method of operation, with the instrument used. The autopsy, performed a few hours later, confirmed her statement as to an abortion having been attempted, and showed that death had resulted therefrom." Suffice it to say the doctor who did all this for $5 was arrested and discharged "scot free." A year later another young woman is reported by the doctor, in the same article, as having died from the result of an abortion; the abortionist was arrested, and, notwithstanding "the chain of evidence seemed to be perfect and unyielding at every point," and the general reputation of the doctor for this kind of work was such that his attorneys made no attempt to prove his previous good character, yet the jury returned a verdict of acquittal.

Dr. Baldwin says in conclusion, "First, if the abortionist does his work, his victim alone being privy to it, he is safe, for if she lives she will not inform against him, while if she dies her statements are entirely worthless as evidence; second, if others are privy to the act, the prosecutor must prove that the fœtus was actually *living* at the time of the operation; and this (at least until after 'quickening,' and even then only on the testimony of an expert, making an examination at the time) is, of course, impossible."

When we have every reason to believe these cases of criminal abortion could be counted by the thousands, if not tens of thousands, throughout our country, that either go without suspicion or detection, or, as we have seen by the above, when one is exposed, it is winked at by the law, and the criminal escapes punishment, we are led as sanitarians to hoist the red flag of danger and call a halt long enough for reflection, and ask, Why is this wholesale mockery of justice throughout our land?

But, some one says, what has all this to do with sanitary work? We answer, the first duty of a sanitarian is to save human life, and the second to prevent human suffering.

It is certainly evident that the practical results of our present criminal laws are such that justice is not only delayed, but in many cases thwarted, in the prosecution of criminals for

murder in the first degree, and in some, yea, many instances, the murderer, instead, becomes the hero of the hour, thus putting a premium on murder and giving encouragement to rather than deterring the vicious from their evil purposes, which is still more encouraged by the multitude of chances for their escape entirely, which aids in multiplying our murders, and thus increases the loss of life from these causes.

The practical results of our criminal laws are still more deficient in cases of "infanticide" than in murder in the first degree, which together swell the mortality records from these sources to such alarming proportions as to call for the speedy reform of our criminal laws; and not until then can we expect to prevent "lynch law" or secure justice in all its details in our criminal courts.

Let us have a law that will *compel* the trial of a criminal arrested for murder within thirty days after his arrest, give it precedence over everything else, try him while the deed, with all its horrible facts, is fresh in the memory of witnesses, try him promptly, fairly, candidly, and allow nothing to retard the dispatch of justice, and, when convicted, compel him to be executed in not exceeding thirty days, and you will find more murderers to the number arrested would be convicted and fewer murders committed.

Instead of waiting for the tardy action of county commissioners or other local authorities to offer rewards for the capture and conviction of criminals, have a standing and liberal reward offered by and under the authority of the State for the arrest and conviction of any murderer, in the first degree, committed in the State, and made chargeable against the county in which the murder was committed. In this way you will get prompt and efficient services in every instance, yea, and further, if necessary, have a central authority in the State which shall have the power to employ detectives to hound down every murderer who commits such a crime in the commonwealth, and instead of depending on the unskilled officers of the county managing the capture of these criminals, have at the State's command a few of the best skilled detectives money will procure, whose duty it shall be to ferret out all criminal cases occurring in the State, and use every means possible to arrest and convict these outlaws in the promptest manner pos-

sible, and thus protect and save human life, in a manner, and with a certainty which, under our present unsystematized methods, is practically impossible.

In the protection against criminal abortions we should purge our present statutes of all those technicalities that now stand as so many open doors for the ready escape of the vilest and most daring criminal, regardless of overwhelming evidence as to his guilt of these loathsome and pernicious practices, and, instead, close every avenue of escape, and measure out to the guilty his due portion of punishment without fear or favor.

Then, as sanitarians, who have the protection of human life and the prevention of human misery at heart, let us seek to secure a remedy for all these existing defects in our criminal laws, and thus prevent the practical results that now follow them as a natural sequel ; and, instead, so modify our criminal code as to make it a real practical supporter instead of a *mocker* of prompt and impartial justice.

In this way, and only by such means, can we expect to reduce the annual number of premature deaths that now are caused by the red hand of the daring assassin, and, at the same time, put an end to the practice of "lynch law," with all its horrors and dangers of rash and unwarranted executions, and, meanwhile, prevent the merciless slaughter of thousands upon thousands of infants annually by the foul hand of the abortionist.

Is not system on the part of the State as essential in the capture of criminals who are guilty of capital crimes, as it is in our military practices for protection against invasions from abroad, or the suppression of riots within our own borders? Then, gentlemen, if our cause is just and right, why should we not "pool" our efforts to secure the enactment of such laws as will provide the best protection against that which God only can give, and no man should be allowed to take away?

RESOLUTIONS ADOPTED.

School Sanitation and Physiology (suggested by Hon. Le Roy S. Brown's paper) :

Whereas, A knowledge of the laws of health is an essential part of the information of those who have charge of the children ; and,

Whereas, Such knowledge is derived to a great extent from the study of anatomy, physiology, and hygiene ; therefore,

Resolved, That, in the opinion of the Ohio State Sanitary Association, all teachers in public schools should be required by law to possess a knowledge of the elements, at least, of anatomy, physiology, and hygiene.

Adopted unanimously.

Syphilis from a Sanitary Standpoint :

Whereas, Dr. C. E. Beardsley has presented the subject of "Syphilis from a Sanitary Standpoint," setting forth the prevalence of this disease, and its dangers to individuals and communities ; and,

Whereas, After a free discussion of the subject, it was considered advisable to recommend proper legislation to protect the innocent from this disease ; therefore,

Resolved, That it is the sense of the Ohio State Sanitary Association that syphilis should be made a legal bar to matrimony.

Adopted unanimously.

The members of the Ohio State Board of Health, who were present, were cordially welcomed, and those members of the Board who were not members of the Association were invited to become such. The President of the Board, Dr. T. Clark Miller, of Massillon, being called upon, made some remarks with regard to the work done by the Board, and what is contemplated being done in the future.

On motion of Dr. Reed, of Mansfield, a committee of three was appointed to confer with the State Board of Health with reference to the publication of the papers read before the Association in its annual report. Drs. H. J. Herrick, of Cleveland, John McCurdy, of Youngstown, and R. Harvey Reed, of Mansfield, were appointed.

Dr. Reed, of Mansfield, next offered the following :

Whereas, We have a State Board of Health ; and,

Whereas, The complete organization of the sanitary service of the State is essential to the success of the Board, and the accomplishment of the greatest benefit to the citizens of the Commonwealth, therefore,

Resolved, That the Ohio State Sanitary Association respectfully recommends to the Legislature such action as will au-

thorize the State Board of Health to appoint a health officer in each county, whose duty it shall be, severally, to attend to the organization of sub-boards, except in counties where boards of health already obtain in cities and towns under existing laws, who shall be subject to the State Board of Health, and report to the same ; and whose compensation shall be fixed by the county authorities severally.

After considerable discussion this resolution was lost by a small majority.

The work of the session, which had been one of the most profitable in the history of the Association, concluded by a vote of thanks to the retiring President, Dr. H. J. Herrick, for the able manner in which he had presided ; to Dr. R. Harvey Reed, the Secretary, for his services ; to the proprietor of the Neil House, for the excellent accommodations furnished for meetings and guests, and to all railroads that had given transportation to the members and delegates at reduced rates.

OFFICERS ELECTED FOR ENSUING YEAR.

Professor E. T. Nelson, A.M., Ph.D., Delaware, President ; D. H. Beckwith, M.D., Cleveland, John McCurdy, M.D., Youngstown, Byron Stanton, M.D., Cincinnati, Vice-Presidents ; R. Harvey Reed, M.D., Mansfield, Secretary ; L. C. Herrick, M.D., Columbus, Treasurer.

The Association adjourned, to meet in Toledo the second week in February, 1888.

DR. H. J. HERRICK, President,
DR. R. HARVEY REED, Secretary.

EDITOR'S TABLE.

"SMALL-POX IN 'DISINFECTED RAGS'" is the caption of recent news from the Holyoke Paper Mills. Readers of THE SANITARIAN are already familiar with previous outbreaks there, under similar circumstances, and the misrepresentations of the paper manufacturers and their supporters, with regard to the danger from imported rags : declaring that no disease had ever been traced to that source in this country, and that the only outbreaks of small-pox or other contagious disease ever traced

to their stock in trade has been to domestic rags. Hence, they have contended, there should be no quarantine restrictions on imported rags at our ports of entry, no matter whence the rags come. And, notwithstanding the evidence which has been repeatedly adduced in these pages of the collection of rags abroad in notoriously infected places, and the utter worthlessness of the processes of disinfection practised at the ports of departure—according to the testimony of the medical inspectors attached to the consulates, and other observers, as illustrated in this case—some of the health officers of Massachusetts have sustained the interested motives of the purblind paper manufacturers of Holyoke. The Secretary of the State Board of Health of Massachusetts and the President of the Board of Health of Boston, both, at the meeting of the American Public Health Association in Toronto, in October last, opposed the action of the Association in the adoption of a resolution declaring that—

"All health authorities having jurisdiction over matters connected with maritime sanitation owe it as a duty to the general public to adopt such systems of disinfection as will thoroughly destroy all disease-bearing germs before the rags are permitted to be distributed for manufacturing purposes;" and were instrumental in having this mischievous sentence added: "If it proves to be impracticable to disinfect them, it is recommended the disinfection may be commenced in quarantine sufficient to insure safety in transportation, to be completed in the manufacturing establishment by such methods as the health authorities may prescribe." Thus inviting a continuance of mere perfunctory performances abroad, and suggesting their practice at home, instead of disinfection, at the imminent risk of the public health. As reported from Holyoke, under date of March 7th: "Dr. Abbott, of the Massachusetts Board of Health, finds that the recent cases of smallpox here originated from bales of linen rags at the Parsons Paper Mill, marked 'disinfected,' and which were imported from Europe by a New York firm. . . . Dr. Abbott thinks it strange that the rags should have been marked 'disinfected.'" That such markings should appear strange to Dr. Abbott is probably due to his want of familiarity with the tricks of the trade to avoid quarantine restrictions, at any risk

to the public health. Moreover, our esteemed contemporary, the *Boston Medical and Surgical Journal*, has hitherto, and still appears (March 10th), to sustain the rag-importers' resistance to the disinfection of imported rags before allowing them to proceed. Of the three persons stricken with the disease, our contemporary remarks :

"One was a man who had never been vaccinated and who worked at the duster, dusting both foreign and domestic rags. This man had a severe form of the disease and died. . . . The other cases were in the persons of two girls, . . . said to have been vaccinated in infancy, but neither of whom presented typical vaccinal scars. The two girls worked on opposite sides of a rag-sorting room, the smaller of two with which the mill was supplied, accommodating thirty-five or forty girls. In this room no rags had for a long time been sorted, except (1) *new* shoe-cuttings from eastern Massachusetts, which had, of course, not been through the duster, and which were the scraps of new cotton cloth left from the linings of shoes ; (2) foreign 'number 1' linens, of two separate marks, the one (one third of the total amount) being of German origin, and the other (two thirds of the total amount) being Russian, but both sorts being shipped from Hamburg, the former imported through a Boston house, and the latter through a New York firm. It is said that the exporter of the German rags had a quantity of this same mark of *rags lying loose in his warehouse for a period of two years before they were baled up. They bore the certificate of the resident United States inspector to having been disinfected by the sulphur process.* In passing to and from their work, these girls, with all the other workers of that room, were obliged to go through the larger rag-sorting room of the mill in which domestic rags were sorted. In this latter room no cases of small-pox have occurred. . . .

"This is the sum and substance of the whole matter as disclosed by an investigation on the part of the State Board of Health. *Contagion altogether outside the paper-mill is not excluded ; contagion from domestic rags is not excluded. The result of the inquiry is negative.* Even the most eager proprietor of a *patent disinfecting process* would scarcely venture to find therein more than *a mild presumptive evidence against the foreign rags.* Even were there conclusive proof, the ardent disinfector should *not forget the difference in behavior between the virus of small-pox and that of cholera.*"

The italics, except *new*, in the first paragraph, are ours, for the purpose of intensifying attention to the length of time the rags in question may have retained infection, the worthlessness

of the process of disinfection certified to by the resident United States inspector, and, notwithstanding, in particular, to the indorsement of the special plea of the rag-importers. Surely nothing could be better calculated to encourage their continued effort to circumvent the port health authorities; and all because, forsooth, the most reliable, most expeditious and most economical means of disinfecting rags in bale hitherto devised is by a "patent process." Sooner than have this, the rag-importers and their supporters would have a devastating epidemic. But most remarkable of all, from such a source, is the suggestion of the two last lines—that though the infection of small-pox may be liable to conveyance by means of imported rags, it is no evidence that cholera may be also!

CHOLERA continues to exist, according to the most recent reports, in the

Argentine Republic.—Consular despatch from Buenos Ayres, dated January 7th, 1887, quoted in Surgeon-General Hamilton's *Weekly Abstract*, March 10th, states that "The average number of cases per day since December 6th has not exceeded 22. The greatest number of reported cases in one day was 57, on December 30th. . . . In the interior of the Argentine Republic, however, the disease has assumed the proportions of an epidemic. In Rosario, during the last month, the daily number of cases averaged 60 to 100, while about 70 per cent were fatal. In Mendoza the development of the disease has been most remarkable, and the population of that city of 20,000 has been almost decimated; and in the country districts the disease was equally fatal. In Tucuman the number of cases has on some days been as high as 500, of which about one half proved fatal. Indeed, the panic at one time was so great that it was not possible to obtain the requisite assistance to bury the dead. In nearly all the other interior cities the disease has been very virulent and fatal, but, not confining itself to centres of population, it has ravaged entire provinces, and farmers (estancierros) and camp men have in great numbers succumbed to it. I am happy to say that, with medical assistance, disinfectants, medicines, and a large supply of good nurses, the disease seems to have greatly abated during the last two weeks, and the hope is entertained

that it will soon have run its course. . . . In Catania, by cablegram, February 28th, 15 cases, 9 deaths."

"*Cairo, Egypt.*—The United States Consul-General, in his despatch, dated December 16th, concerning the inspection of Egyptian rags, states that, 'As a sanitary measure, I think Egyptian rags should be closely scrutinized. The sources from which these rags are obtained are of the filthiest character. Though cholera does not now exist in Egypt, that terrible malady, small-pox, is always prevalent here. It now prevails largely throughout the country, and rags reeking with infection are sold in the markets, and, no doubt, they find their way to ports of the United States. These people care nothing for disease; they do not seem to fear infection or contamination, and official sanitation being barely in its inception, a mere sham even where it is locally proclaimed, there is absolutely no protection against rags being sold to dealers directly from the bodies of those affected with this loathsome disease, and there can be no doubt that such poisonous rags find their way to the United States ports. I would therefore urgently present the necessity of strict measures regarding the perfect disinfection of Egyptian rags intended for shipment to the United States.'

"*Nagasaki, Japan.*—The United States Consul, in his despatch dated December 27th, 1886, states that 'the port of Nagasaki was officially declared free from Asiatic cholera November 6th. The epidemic of the present year in Nagasaki Ken, owing to the speedy and vigorous restrictive measures adopted by the Government, was not so severe as last year. In 1885, from August 13th to November 14th, practically the limits of the duration of the disease, there were 4435 cases, and 2927 deaths. This year, from August 9th to November 6th, there were 2384 cases, and 1551 deaths. While the character of the disease was as severe, and the percentage of deaths about the same as last year, being about 65 per cent, the number of persons attacked is less by over 2000. At Takasima Colliery, on the Island of Takasima, near Nagasaki, the point at which last year the epidemic raged with great severity, of the 4000 men employed in the mines, 1500 were attacked, and 800 died. . . . While the cholera experience of 1885 has not been repeated in Nagasaki and vicinity in 1886,

the epidemic has raged with virulence in other parts of the empire of Japan. In 1885 there were altogether 11,927 cases and 7152 deaths, the proportion of mortality being about 60 per cent. This year (1886) there were 154,373 cases, and 101,695 deaths, a proportion of about 66 per cent. We may say that the cholera in Japan during the past year has spread widely, has been exceptionally severe, and the percentage of deaths enormous.' ''

Calcutta.—Of 592 deaths during the two weeks ending December 28th, 112 were from cholera.

SMALL-POX.—Deaths reported from this disease abroad during the week ending February 19th, in *Newcastle*, 1; *Alort*, 2; *Paris*, 7; *Bucharest*, 1. Week ending February 12th, in *Vienna*, 1; *Pesth*, 26; *Prague*, 5; *Warsaw*, 9; *Odessa*, 1; *Venice*, 2. Week ending February 5th, *St. Petersburg*, 6; *Lisbon*, 2. Week ending February 3d, *Guayaquil*, 6. Week ending January 8th, *Rome*, 11. Week ending January 3d, *Cairo*, 2; *Alexandria*, 1; *Port Said*, 5. During the month of December: *Marseilles*, 17; *Milan*, 40; *Besançon*, 2. Two weeks ending January 31st, *Nice*, 6. December 21st to 31st: *Turin*, 2. During the month of January: *Mexico*, 16.

YELLOW-FEVER.—Deaths reported during the two weeks ending February 13th, in *Para*, 6. Week ending February 24th, in *Havana*, 2. Week ending February 5th, in *Bahia*, from on board ship, 2. Week ending February 3d, *Guayaquil*, 28.

MORTALITY AND MORBILITY STATISTICS AT MOST RECENT DATES.

ALABAMA.—*Mobile* report for the month of December, deaths, 76; under 5 years, 16; from zymotic diseases, 6; consumption, 12. Death-rate (on population of 1880, 31,295), 28.6.

CALIFORNIA.—The Secretary of the State Board reports for the month of January returns from 63 towns and cities, comprising a population of 560,250, total number of deaths 915—a decided increase over the previous month, chiefly from pulmonary diseases and diphtheria. From *consumption*, 153; *pneumonia*, 78; *bronchitis*, 32; *congestion of the lungs*, 12;

diphtheria, 57—40 of which were in San Francisco. From *typhoid-fever*, 21—13 in San Francisco.

CONNECTICUT.—Summarized from the report of the Secretary of the State Board of Health for the month of January, the mortality and chief causes of death in nine cities were as follows :

New Haven, 108 ; zymotic diseases, 13 ; phthisis, 26 ; pneumonia, 14 ; nervous diseases, 17 ; heart disease, 4.

Hartford, 86 ; zymotic diseases, 9 ; phthisis, 12 ; pneumonia, 7 ; nervous diseases, 7 ; heart disease, 11.

Bridgeport, 69 ; zymotic diseases, 8 ; phthisis, 12 ; pneumonia, 13 ; nervous diseases, 1 ; heart disease, 8.

Waterbury, 38 ; zymotic diseases, 6 ; phthisis, 8 ; pneumonia, 4 ; nervous diseases, 3 ; heart disease, 2.

Norwich, 34 ; zymotic diseases, 7 ; phthisis, 4 ; pneumonia, 5 ; nervous diseases, 2 ; heart disease, 2.

Meriden, 28 ; zymotic diseases, 3 ; phthisis, 1 ; pneumonia, 4 ; nervous diseases, 8 ; heart disease, 2.

New Britain, 13 ; zymotic diseases, 1 ; phthisis, 4.

Middletown, 23 ; zymotic diseases, 3 ; phthisis, 3 ; pneumonia, 2 ; nervous diseases, 2 ; heart disease, 1.

New London, 19 ; zymotic diseases, 3 ; phthisis, 1 ; nervous diseases, 7.

Total, 418—115 were of children under 5 years.

In public institutions there were 8 deaths in New Haven, 10 in Hartford, and 6 in Middletown. Deducting these from the full number reported, gives the following as the annual death-rate for the cities : New Haven, 15 ; Hartford, 19 ; Bridgeport, 20.5 ; Waterbury, 15.2 ; Norwich, 17.7 ; Meriden, 15.2 ; New Britain, 8.6 ; Middletown, 17 ; New London, 19. The annual death-rate in these nine cities was 14.8 per 1000 of the population, which is a rate decidedly better than that of the previous three months, when the average in the cities was over 16.

DELAWARE.—*Wilmington* reports 98 deaths during the month of January, in a population of 57,000, of which 54 were under 5 years of age. Death-rate per 1000, 20.63. From zymotic diseases there were 8 deaths, and from consumption, 18.

ILLINOIS.—*Chicago* reports 1261 deaths during the month of January in a population of 704,000, of which 577 were under 5 years of age. Death-rate per 1000, 21.49. From zymotic diseases there were 305 deaths, and from consumption, 135.

Rock Island reports for five weeks ending January 29th, 29 deaths in a population estimated at 13,655, of which 10 were under 5 years of age. Death-rate per 1000, 21.9. From zymotic diseases there were 2 deaths, and from consumption, 7.

LOUISIANA.—*New Orleans* reports for January 296 deaths in 176,500 white population, and 173 deaths in 66,250 colored population, making the respective death-rates 20.12 and 31.33 per 1000, and 23.18 for the whole population of 242,750. The deaths from zymotic diseases numbered 30, and from consumption, 13. There were 122 deaths under 5 years of age.

MARYLAND.—*Baltimore* reports for five weeks, ending January 29th, 742 deaths in a population estimated at 417,220, of which 257 were under 5 years of age. Death-rate per 1000, 18.30. From zymotic diseases there were 101 deaths, and from consumption, 119.

MICHIGAN.—For the month of January, 1887, the Secretary's summary of reports shows that pneumonia has increased in prevalence. Compared with the average for the same month in nine years, 1879 to 1887, intermittent-fever, diphtheria, consumption, scarlet-fever, bronchitis, remittent-fever, pneumonia, and whooping-cough were less prevalent in January, 1887. Diphtheria was reported during the month at 56 places, scarlet fever at 36, typhoid-fever at 14, and measles at 21—all decreased except measles, of which there was an increase of 5 places. The Secretary remarks that—

"By the vital statistics in Michigan it is found that small-pox has been comparatively epidemic every five years. Thus, in 1872 there were 302 deaths reported in Michigan from small-pox; in 1877 there were 102; and in 1882 there were 100. This is the last year of one of these five-year periods, and according to past experiences we may expect small-pox this year. Small-pox is present in New York, Ohio, and Wisconsin, and if immigration this year is large, the danger from

small-pox may be increased. This would seem to be a good year for vaccination against small-pox."

At the regular quarterly meeting of the State Board, January 11th, the Secretary submitted an unusually interesting summary of the life-saving results of practical sanitation in Michigan, since the establishment of the State Board of Health, from which we purposed to give an abstract, but the pressure on our pages for the present month compels us to defer it to next number.

Detroit reports 335 deaths during the month of January, in a population of 180,000, of which 82 were under 5 years of age. Death-rate per 1000, 21.91. From zymotic diseases there were 99 deaths, and from consumption, 34.

MINNESOTA *Bulletin* for January reports infectious diseases: *diphtheria*, 58 cases, 18 deaths; *scarlatina*, 60 cases, 7 deaths. *Diseases of animals:* Glanders remaining on hand first of last month, 15; reported during the month, 12; killed, 16; released, 1; isolated, 6. Remaining, February 1st, isolated or not accounted for, 10.

St. Paul reports 114 deaths during the month of January, in a population of 125,000, of which 61 were under 5 years of age. Death-rate per 1000, 10.94. From zymotic diseases there were 33 deaths, and from consumption, 8.

MISSOURI.—*St. Louis* reports 716 deaths during the month of January, in a population of 420,000, of which 272 were under 5 years of age. Death-rate per 1000, 20.45. From zymotic diseases there were 160 deaths, and from consumption, 71.

NEW JERSEY.—*Newark* reports 350 deaths during the month of January, in a population of 160,779, of which 130 were under 5 years of age. Death-rate per 1000, 26.08. From zymotic diseases there were 46 deaths, and from consumption, 33.

Hudson County reports 482 deaths during the month of January, in a population of 258,434, of which 187 were under 5 years of age. Death-rate per 1000, 22.1. From zymotic diseases there were 71 deaths, and from consumption, 71.

NEW YORK.—The total reported mortality by State Board *Bulletin*, of 121 cities and towns, comprising 3,275,426 inhabitants, for the month of January, is 7671 ; of which 36.8 per cent were under the age of 5 years. From zymotic diseases there were 1248 deaths, a ratio of 162.91 per 1000 total mortality. From diarrhœal diseases, the ratio per 1000 deaths is 10.16 ; from typhoid-fever, 9.38 ; from croup and diphtheria, 52.93. From consumption the ratio of mortality is 137.81 per 1000 deaths, and 217.93 per 1000 above the age of 5 years. The combined death-ratio per 1000 from zymotic diseases, consumption, and puerperal diseases, is 310.00. From acute respiratory diseases there were 189.56 deaths per 1000 total mortality. The relative mortality from zymotic diseases has not been so low since the spring months of 1886 ; there is material falling off in the death-rate from diphtheria ; the considerable mortality from measles is confined almost entirely to the maritime district. There is a large death-rate from acute respiratory diseases. For December 350 delayed returns have been received. Buffalo (too late for insertion) reports 376 deaths for five weeks ending January 29th, of which 155 are infant mortality, and 75 from zymotic diseases, making total mortality for the State, 8047.

New York City, 1,481,229 : Deaths for the month, 3507 ; under 5 years, 1520 ; of *zymotic diseases*, per 1000, from all causes, 190. By *croup* and *diphtheria*, 147 ; *typhoid-fever*, 28 ; *measles*, 293 ; *malarial diseases*, 25 ; *whooping-cough*, 32 ; *small-pox*, 10 ; *consumption*, 522 ; *acute respiratory diseases*, 698. Death-rate, 28.26.

The most notable event in the health service of New York, is the recent appointment of Mr. James C. Bayles, President of the Board of Heath, in the place of General Shaler, removed. It is the first example of recognized special competency, by the appointing power, since the organization of the New York Health Department. All previous appointments to this important office have deferred to qualifications wholly apart from any knowledge of practical sanitation. In Mr. Bayles's case, to those wholly due to these considerations, in conjunction with, at least, equal qualifications with any one who has ever preceded him in contingent requirements necessary for the best exercise of his office. Sanitarians have, for

several years, considered Mr. Bayles one of themselves; hence they have just reason for gratefulness to the Hon. Mayor, Abraham S. Hewitt, for this signal recognition.

Brooklyn, 690,000: Deaths, 1391; under 5 years, 601; of *zymotic diseases*, per 1000, from all causes, 168.22. By *croup* and *diphtheria*, 111; *typhoid-fever*, 4; *malarial diseases*, 16; *whooping-cough*, 15; *scarlet-fever*, 18; *measles*, 44; *small-pox* (including those who died in county hospital), 15; *consumption*, 182; *acute respiratory diseases*, 345. Death-rate, 24.20.

Rochester, 110,000: Deaths, 170; under 5 years, 59; of *zymotic diseases*, per 1000, from all causes, 223.53. By *croup* and *diphtheria*, 28; *typhoid-fever*, 3; *malarial diseases*, 3; *scarlet-fever*, 4; *consumption*, 19; *acute respiratory diseases*, 20. Death-rate, 18.54.

OHIO *Health Bulletin* for five weeks, ending February 4th, reports cases of: *Measles*, 2258; *diphtheria*, 406; *scarlet-fever*, 249; *croup*, 135; *whooping-cough*, 125; *typhoid-fever*, 76; *typho-malarial fever*, 45; *small-pox*, 4. *Measles* seems to have reached its height during the week ending January 14th—731 cases. Two weeks later the number was 255; but during the following week, again increased to 359. *Scarlet-fever*, also, after decreasing from 71 to 26, during the four weeks ending January 28th, rose to 56 during the following week. Diphtheria appears to have followed the same course as scarlet-fever—decreased from 104 to 41 cases during the four weeks, and during the fifth rose to 62. Aucte pulmonary diseases were also very prevalent.

Cincinnati reports 573 deaths during the month of January, in a population of 325,000, of which 260 were under 5 years of age. Death-rate per 1000, 21.15. From zymotic diseases there were 137 deaths, and from consumption, 74.

Toledo reports 76 deaths during the month of January, in a population of 73,000, of which 25 were under 5 years of age. Death-rate per 1000, 10.41. From zymotic diseases there were 13 deaths, and from consumption, 11.

A Sanitary Convention, under the auspices of the State Board of Health, will be held at Warren, Trumbull County, O., on Wednesday and Thursday, March 30th and 31st, 1887. Topics of great interest to the people will be presented by men who

have given thoughtful and practical attention to sanitary questions.

For further information and programme address C. O. Probst, M.D., Secretary, Columbus, O.

PENNSYLVANIA.—*Philadelphia* reports for five weeks, ending January 29th, 2085 deaths in a population estimated at 971,363, of which 645 were under 5 years of age. Death-rate per 1000, 22.3. From zymotic diseases there were 277 deaths, and from consumption, 308.

Pittsburg reports for five weeks, ending January 29th, 433 deaths in a population estimated at 200,000, of which 190 were under 5 years of age. Death-rate per 1000, 25.1. From zymotic diseases there were 122 deaths, and from consumption, 36.

RHODE ISLAND.—*Providence* reports 216 deaths during the month of January, in a population of 120,000, of which 71 were under 5 years of age. Death-rate per 1000, 21.60. From zymotic diseases there were 41 deaths, and from consumption, 29.

TENNESSEE *Bulletin* reports: The principal diseases named in the order of their greater prevalence in the State for January, were: *Consumption, pneumonia, typhoid-fever, malarial-fever, bronchitis, and rheumatism.* In the chief cities the respective populations and death-rates are reported as follows:

Chattanooga,	white,	20,000;	colored,	10,000;	30,000;	white,	13.80;	colored,	46.80 : 24.80
Clarksville,	"	5,000;	"	3,000;	8,000;	"	7.20;	"	32.00 : 16.50
Columbia,	"	2,391;	"	1,859;	4,250;	"	.00;	"	25.81 : 11.29
Knoxville,	"	23,372;	"	6,738;	30,110;	"	16.42;	"	37.39 : 21.12
Memphis,	"	40,207;	"	22,128;	62,335;	"	12.23;	"	27.65 : 17.70
Nashville,	"	38,400;	"	21,600;	60,000;	"	15.00;	"	35.54 : 22.39.

VIRGINIA.—*Richmond* reports 166 deaths during the month of January, in a population of 100,000, of which 60 were under 5 years of age. Death-rate per 1000, 19.92. From zymotic diseases there were 20 deaths, and from consumption, 25.

WISCONSIN.—*Milwaukee* reports 227 deaths during the month of January, in a population of 175,000, of which 60 were under 5 years of age. Death-rate per 1000, 15.6. From zymotic diseases there were 35 deaths, and from consumption, 20.

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RAGS AND INFECTIOUS DISEASES.

REPORT OF THE COMMITTEE OF THE AMERICAN PUBLIC HEALTH ASSOCIATION ON THE DISINFECTION OF RAGS, AT THE MEETING IN TORONTO, OCTOBER 6, 1886.*

Collated Evidence, Chiefly from Recent Publications, on the Propagation of Disease by Rags and their Congeners—Infected Clothing.

THE following summary is made in virtue of the vote of the Association on the eve of adjournment at its last session, Washington, December 11th, 1885, to refer back to the Committee on the Disinfection of Rags the preliminary report it had made by special direction of the Association, on the implied ground that the said report was not justified by evidence. Dr. Ruijsch, of The Hague, read a paper before the Fifth International Congress of Hygiene, at The Hague, 1884, on "Rags: A National and International Danger," in which he proceeds "first to examine the amount of danger there is in infected rags, old clothes, linen, and wearing apparel." "When commencing our inquest," he remarks, "we consult the annals of the Medical Inspection of Netherlands since 1865, we find a long array of facts—alas! too long—stated by the medical inspectors, which show that in Holland, also, rags and old garments have had a large influence in propagating diseases.

"In 1868 various men working in a paper-mill at Wormerveer had been handling rags from infected origin, and were taken with typhus.

* Pamphlet Edition from the Proceedings, by order of the Association.

"In 1870 the first cases of small-pox that appeared at Breda were among persons who had been washing infected clothing from a small-pox patient, coming from an infected district. In 1870, 1881, and 1882 the same thing happened at Utrecht.

"In 1873 a pillow infected by a small-pox patient caused several cases of small-pox to appear at Goreem, while in that same year a rag-picker's daughter was attacked after having bought some rags from a person who had had small-pox, and caused also a new epidemic to break out. The appearance of the disease at Ohé and Laak, and at Olkmaar, was also due to the importation of infected clothes from infected localities in Belgium and at The Hague.

"The origin of the small-pox epidemic in 1871 at Heerde and Epe the medical inspector attributed to rags. In that same year Schyndell and Rozenburg were invaded with small-pox by the importation of infected clothes from Schiedam. The cases of small-pox that broke out in 1873 in the hospital at Utrecht were traced to insufficiently disinfected bed-quilts, which had been infected by small-pox patients treated there in 1872. The same origin is given to the Tilburg epidemic in 1873.

"In 1870 and 1880 consecutively were attacked with small-pox persons who, while working in a paper factory at Maestricht, had been handling rags, or had visited the locality where rags are selected, whereas during all that time no other case of the disease was known in Maestricht, but only in Belgium, whence the suspected rags were partly coming. In 1880 a dealer in rags conveyed small-pox from Rozindaal to Vouw. In 1881 the infected rags from Gouda caused an epidemic at Barendrecht, etc., etc. It would be a waste of time to cite all the cases where rags and infected linen have brought on epidemics.

"And when we look at the report on cholera, we are amazed to see that its origin and propagation are always traced to the influence of clothing, dresses, and the traffic in old garments and rags. Thus, a rag-picker from Amsterdam, where cholera was raging, introduced it into the city of Tilburg in 1866 in a truck-load of infected clothes. At Druten a rag-picker was the first victim in that commune. At Mearssen the first one attacked with cholera was a ragman. Again, at

Heusden, Oudenbosch, Hindelopen, Nieusisburg, Leeuwarden, and Bois-le-Duc cholera was propagated by the handling and washing of old clothes, clothing, bed-clothing, etc.

"In England, France, Germany, etc., the same facts go to prove the propagation of diseases, and principally of small-pox. One of the most interesting works on this subject is certainly Doctor Gibert's report on the epidemic at Marseilles, that had exactly the same characteristics as the small-pox epidemic of 1874 and 1875, and proved beyond doubt the great influence of rags on epidemics. So, to cite only two facts, in 1874 there were 117 rag-stores in Marseilles, of which 46 were in one district. In that district the number of deaths from small-pox was three times larger than in any other district, while of 157 cases of death 64 occurred in rag-pickers' houses, or in houses in close proximity to rag-pickers or rag-stores. In that district Gibert found a cellar, a secret store-room for rags, which infected six persons, of which four died." *

Dr. George M. Sternberg, U. S. Army, in a letter to the New York *Medical Journal* (August 29th, 1885), quotes from a letter he had received a few days before from Dr. Sondenegger, President of the Swiss Aerzte Commission, and delegate from Switzerland to the International Sanitary Conference of Rome, as follows:

"The fact relating to rags was observed and described by Professor Biermer (living now in Breslau as Professor of Practical Medicine), and by Dr. Zehnder, Vice-Director of the Board of Health (Sanitätsrath), who were both most active at the time of cholera at Zurich in 1867: July, August, September, October—number of patients, 684; number of deaths, 65.9 per cent.

"Kriegstetten is a small village in the Canton of Solothurn, at eighty to one hundred kilometres' distance from Zurich, and not connected with this town either by water (lake, river, marsh), or by trade and industrial commerce. There is a paper-mill at Kriegstetten, and a workwoman, who had to tear the rags, was suddenly taken with cholera, and died the following day. The following days sixteen more workwomen (all occupied in tearing the rags) were taken sick; of these,

* The Sanitarian, September, 1885.

eleven died. A careful examination showed that all of these rags went from Zurich, and from cholera houses; therefore, the whole mass of rags was disinfected by boiling. After this no case of cholera occurred. The large establishment of the paper-mill, as well as the village, remained free. I mentioned the fact in a little address to the Swiss people, which I have the honor to send you; and nobody doubted the fact, or made any opposition. The fact was known everywhere in Switzerland."

Dr. William M. Smith, Health Officer of the port of New York, and *ex-officio* member of the State Board of Health of New York, and of the Health Department of the city of New York, in an official report to the last-named body, October 16th, 1885, makes the following citations in addition to those of Ruijsch already referred to:

The *British Medical Journal* of May 11th, 1878, p. 686, speaks of "rags as disseminators of disease," and refers to "the measures taken by the Austrian Government to prevent the spread of disease by obtaining the adoption of uniform precautions in all the neighboring states, in the shape of strict enforcement of sanitary regulations and the prohibition of the importation of rags." "The authorities of Austria," the article remarks, "have for some time forbidden the importation of rags." Vol. I., p. 863, of the same journal says: "An epidemic of small-pox, which spread somewhat widely, broke out at Abenheim, in the canton of Worms, Rhenish Hesse. Almost all the patients at the outset were five women, who worked in a rag-factory cutting up and assorting rags. The cases were investigated, and it was found that a portion of these rags came from Marseilles, where small-pox prevailed to a serious extent."

The *British Medical Journal* of July 3d, 1880, Vol. I., p. 21, says: "Girls who worked at storing rags at Canterbury contracted the disease and communicated it to twelve others." "The then health officer said that during the period of three years there had not been a case of small-pox in the city the origin of which had not been traced to the factory." In 1878 cases originated in the same factory. In 1879 another case occurred there. Dr. Butterfield, in his last annual report on the health of Bradford, wrote: "No case of small-pox had oc-

curred in the borough for many months, when a girl who had not left the neighborhood was taken sick. In a few days another young woman employed in the same work exhibited symptoms of the disease." "March, 1878, several persons, residing apart, but working in the same room at a rag-warehouse, were simultaneously affected with small-pox, and from them extended to about thirty others." "At Whittlesford, in 1873 and 1875, there were two outbreaks of small-pox from the same cause." "At Thetford an epidemic of six months' duration, and from which sixteen or seventeen deaths resulted, was traced by Dr. H. J. Hunter to two women engaged together in cutting up some foreign rags, and who fell ill the same day."

Under date of January 20th, 1883, the *British Medical Journal* said: "An outbreak of small-pox has just taken place at New Cathcart under peculiar circumstances. A local firm of paper-makers received in December last a quantity of rags from Königsberg *via* Leith. The workpeople in their employment have been engaged in cutting them up recently, and within the last few days four of them have been seized with small-pox, and some others have sickened with what is feared will turn out to be the same disease."

The Thirteenth Annual Report of the Local Government Board (of England, 1883–84) contains the following in the report of the medical officer of the board:

"Of infectious diseases which are known to have been conveyed to persons engaged in the rag trade or in paper-making, small-pox is by far the most frequent." And again he remarks: "It has been thought desirable to take exceptional precautions to prevent the introduction of cholera by them [rags] into English ports."

The restrictions on the importation of rags at the port of New York are by no means without precedent. Reference has been made to the restrictions by Austria. Holland has a very rigid inspection law. And a French decree, dated as early as March 15th, 1879, compels "all rags imported into France by sea to be disinfected; and the importation of rags is restricted to certain ports where disinfecting apparatus has been provided." In order to evade this, rags have been unloaded at neighboring ports in other countries, and thence carried by

land across the frontier. With a view of preventing this, it has been recommended that the importation be restricted on land to places where a disinfecting arrangement is provided.*

The following is from the *British Medical Journal* of May 2d, 1885 :

" The Woodside Rag Works at Aberdeen, the outbreak of small-pox among the workers in which was the subject of a question by Dr. Farquharson on April 23d, have repeatedly been the scene of similar outbreaks of the same disease, and it would be worth while, therefore, that some special inquiry should be made as to the precautions adopted by the proprietors for preventing such occurrences in future.

" Some of the better known paper-makers in England have now a regular set of regulations for minimizing the danger arising from the handling of infected rags. It is impossible, perhaps, absolutely to prevent the occurrence of a case of small-pox from this cause without measures of disinfection being applied to all rags. Although we have no reason for assuming that other diseases are not spread by rags, we have chiefly records of small-pox distributed in this way."

Section 49 of the Scotch Public Health act of 1867 (corresponding to section 125 of the English act of 1875) imposes a penalty on any person who " gives, lends, sells, transmits, or exposes, without due disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any dangerous infectious disorders." The belief that old rags communicated contagion is so considerable in England that it has been the subject of discussion in the House of Commons.

British Medical Journal, August 25th, 1883, p. 397 : " House of Commons, August 15th, 1883. Importation of Disease by Rags. Sir S. Northcote asked the President of the Local Government Board whether his attention had been called to some cases of small-pox reported from a place in his constituency, which were supposed to have originated from foreign rags among people employed in certain paper-mills. There was one death last week, and there had been several other serious cases of illness. He called the attention of the Local Government Board to the subject in the hope that some

* See *British Medical Journal* of August 4, 1883.

restriction might be devised to check the propagation of infection by rags."

The *British Medical Journal* of 1880, Vol. I., p. 952, has a report by Dr. Henry S. Alford, Medical Health Officer in the Tauton district, in relation to the Abenheim epidemic of small-pox, in which he alleges that the disease was communicated by "rags that had been on the premises six months, and were obtained from Russia or Wales." No cases had occurred in the village, nor had the girls first attacked left home.

CHOLERA AND SMALL-POX COMMUNICATED BY CLOTHING.

"John Barnes, a laborer, had been suffering for two days from diarrhœa and cramp, when, on December 28th, he was taken ill with the symptoms of cholera and died. The next day Barnes's wife and two other persons who visited the sick man were seized with cholera, but recovered. The son of the deceased man then arrived. It appears he had been apprenticed to his uncle, a shoemaker in Leeds, and that his aunt died of cholera fifteen days before, her effects having been sent to Barnes without having been washed. The trunk containing the things had been opened by Barnes in the evening, and the next day he was taken ill and died." *

"In 1854 cholera was not known in the county of Bedford, when it broke out in the village of Ridgmont, and eleven cases occurred, all of which were fatal. It was ascertained that the first case occurred in a man whose son had died of cholera in London a week or two before, and whose clothes were sent down to the country. The poor man unwrapped the bundle of clothes himself; he was seized with the disease and died. This case was the nucleus of the others. An instance of similar nature was reported from Lustheim, near Munich, where the first case of cholera was generated in the house of a laborer, one of whose daughters was in service at Munich. The latter sent her parents clothes belonging to a family some members of which had just died of cholera. These old clothes were at once appropriated and worn. Three days afterward (September 21st, 1854) the father and mother were seized with cholera and died. On the 22d and

* *Lancet*, vol. ii., p. 109.

25th other members of the family took the disease. Dr. Lebert reports the case of a man who was attacked with cholera, having worn the clothes of a person who had died of the disease two months previously.

"On the 24th of December, 1848, a woman and two children died of cholera in Suon Fields, Southwark. The clothes of the children were sent to Boston for the use of a third child living with its grandmother. The old lady and child unpacked the parcel, and both were attacked with cholera. There were no other cases in Boston until eight months afterward.

"It is well authenticated that during the epidemic in the United States in 1873 cholera was introduced in effects of emigrants. The vessels which brought them were in perfect sanitary condition. Passengers were healthy, and remained so after landing and until they reached Carthage, O., Crow River, Minn., and Yankton, Dak., where their goods were unpacked. At each place, within twenty hours after poison particles were liberated, the first case appeared."

Dr. H. B. Baker of this committee communicates the following: "Many years ago, in one of the early outbreaks of cholera in the then North-west, a mattress soiled by a cholera patient was thrown overboard from a vessel on or below Lake Huron. The mattress floated down the St. Clair River, and being seen from the shore, a man went out in a boat and brought it to the shore, where his wife washed and cared for it. This man and his wife both contracted the cholera. I had this information from Captain E. B. Ward, from whose vessel the cholera-soiled mattress was thrown overboard."

If the contagion of cholera may be preserved in clothing for weeks and months, why not in rags? From the collection of the works of the "Comité Consultatif" of Public Hygiene, Paris, 1883, Vol. XII., p. 83. Council of Public Hygiene, Dr. Vallin, Reporter. (Translation.) Depot and Sorting Warehouses for Rags:

"Rag-sorting is done on a vast scale in the department of Oise, particularly at Criel. The quantity of material which comes to the warehouses has a value of 15,000,000 francs per annum. An epidemic of variola, which devastated the Arrondissement in 1877 and 1878, has been attributed by Dr. Boursier, member of the Council of Hygiene in the Arrondissement of Senlis, to the propagation of variolous virus by the

rags. About July, 1878, five sorters of rags working in the warehouse at Criel were attacked with small-pox. They conveyed the disease to their relations and neighbors ; their soiled clothing infected the proprietor and workers in a floating laundry. The course of the epidemic could be followed from its point of origin to twenty communes. The deaths at Criel, Montataire, and Nogent were twenty-two ; in the Arrondissement, forty.

" Garments by chance whole are taken by the class of unmarried working people who are destitute of resources. Others, which have been patched or worn too much, serve for wiping-cloths for the machines in factories. All white goods, linen or cotton, are destined for the paper-mills, except a slight amount of old linen deducted for charpie or surgical dressings. The best is sent to English paper-mills on payment of the customs. Colored fabrics, cotton or half linen, are also the subjects of a minute classification, and the refuse is sold as waste. The rest passes to the weavers for manufacture into new fabrics. The dust raised by this sorting is horrible and infective. This dust contains sometimes virulent germs."

State Board of Health, Michigan, 1882, Allegan County, page 393. Dr. B. Thomson, Health Officer of Plainwell, reported on April 15th, 1882, small-pox contracted while working in a paper-mill, from which three other cases originated.

Sixth Annual Report State Board of Health, Connecticut, 1883. General Report. Small-pox, page 22. " The disease was several times introduced by tramps, more often by emigrants brought up from New York for domestic or out-door service, and a few times by paper-rags. This is the principal danger from the latter source, as shown by the investigation made by the board a few years ago, and perhaps the only one that is liable to occur at any time. As New Haven is the chief port of entry for the State, and one of the three principal ports of entry for rags in the country, the chief danger will occur there." Secretary's Report, page 225. In Manchester and Windsor Locks there were several cases (small-pox) infected from paper-rags, and in the latter place the disease broke out the second time in the same locality.

State Board of Health, Michigan, 1881. Secretary's Report. Proceedings of Board, July 12th, 1881. " Dr. Jackokes mentioned the formation of a sanitary association at Pontiac,

and said there was need for such effort there. He spoke of the spread of small-pox by an immigrant tramp-burglar, who communicated the disease to another prisoner. The clothing left in the pest-house was supposed to have been disinfected, having been treated for that purpose, the pest-house locked up and labelled. The clothing was stolen, however, and the disease communicated to sixteen persons by it, and the disease still further spread by them. He said the information as to what constitutes disinfection was much needed there, and it was owing to inefficient disinfection that the disease was conveyed by the clothing." Also, page 295, Prevention and Restriction of Small-pox: Section 22, Rags. "No person should handle old clothing or rags without taking precaution to prevent the spread of communicable diseases. Children should not be allowed to go near a rag-picker's collection, nor into the rag-rooms in paper-mills or storehouses."

Fifth Annual Report, Massachusetts State Board of Health, 1877. Article headed, "Health of Towns." Answer of correspondents, page 548: West Springfield. "We, in common with the rest of the State, suffered from small-pox, originating in the rag-picking of one of our paper-mills, and spreading rapidly, there being no care taken to isolate the sufferers."

Connecticut State Board of Health. Fourth Annual Report, 1881. It is said, in report of small-pox: "One or two instances, where paper-stock was the medium of conveying the contagion, should have been mentioned."

State Board of Health, Michigan, 1878, page 62. June 6th, 1878, William Simonds, M.D., Health Officer of Warren Township, Macomb County, reported details of twenty-three cases of small-pox, occurring from February 1st to May 17th, 1877. In some of the cases the disease was derived from clothing from the city, in some cases from the paper-mill. Of the twenty-three cases, seven died.

Annual Report State Board of Health, Wisconsin, 1882. Secretary's Report, page 53, Small-pox: "A single case, the origin of which could not be ascertained, occurred in the city of Appleton. It was conjectured that infected rags at one of the paper-mills caused the case, a relative of the patient being employed in the sorting-room of one of these establishments." Page 58, Dr. Grasmuck, of Menasha, writes as follows: "A case of variola was discovered here (January 21st) to-day; is

about the sixth day of development. It had been kept hidden, and many have been exposed. The disease was probably contracted at the paper-mills."

Massachusetts State Board of Health, 1873, page 463. Extracts from table showing cases of small-pox in the State of Massachusetts in 1872, and February, 1873, such table being made in pursuance of order passed by House of Representatives, January 21st, 1873 :

Cities and Towns.	No. of Cases.		Probable Source of Infection.
	1872.	Feb. 1873.	
Adams.....	34	.....	Paper rags.
Blackstone	10	.....	"
Cummington.....	19	.....	"
Dighton	17	.....	"
Fitchburg.....	24	1	" and Boston.
Holyoke	32	.....	"
Huntington	3	.....	"
Lee....	14	1	"
Montgomery	6	.....	"
West Boylston...	1	.....	"
West Springfield .	12	4	"
South Hadley....	8	.....	" Holyoke.
Dalton.....	6	.....	" Lee.

National Board of Health, *Bulletin,* Vol. I., No. 4. Washington, D. C., May 1st, 1880 : Ypsilanti, Mich. Dr. E. Batwell, Health Officer of this town, reports to the State Board of Health two cases of small-pox in which the contagion was ascribed to rags at the paper-mills. A girl working in a paper-mill, and her brother who was daily about the rag-room, were seized with variola at the same time. Several neighbors were exposed before the nature of the disease was made known.

Second Annual Report Wisconsin State Board of Health for the year ending December 31st, 1877. Extracts from communications of correspondents by the Secretary of the Board ; page 140, Menasha : " During the year ending September, 1877, the city of Menasha was visited by an epidemic of small-pox, extending from December, 1876, to May, 1877, assuming in progress a severe form. During that period about

seventy cases occurred, with a proportion of deaths of nearly one to six. From May to December several more cases were reported, but no deaths, most of the cases assuming a mild form. The epidemic originated in the paper-mills at Neenah, and the cases occurring in Menasha all sprung directly or indirectly from that source. The first two cases that came under the care of a physician fell into my hands. They were young women, eighteen to twenty years of age, who had been working in one of the paper-mills at Neenah, and had never been vaccinated. Had the proprietors been more thorough in enforcing vaccination among the employés, I am certain the epidemic would not have been so widespread. So late as April 26th I attended a case that originated in one of the mills. The patient had worked there two months or more without being vaccinated." Page 141, Neenah: "Beginning in November, 1876, simultaneously in this city and Menasha, small-pox continued, with short periods of intermission, through the winter, and well into warm weather in the spring. During this time there were in this city some twenty unmistakable cases, the mortality being light; while in the neighboring city of Menasha the number of cases is estimated at sixty, with a much larger proportion of fatal cases. In both places the original and principal source of infection was the paper-mills."

Also, same report, page 95. Supplementary Report on Small-pox, by E. L. Griffin, M.D., of Fond du Lac, President: "In Neenah and Menasha the disease was believed to have been communicated by means of paper-rags brought from Milwaukee. There were three distinct cases in as many different families, which were reported at the same time, being three girls who were employed in sorting rags in the paper-mills. During the course of the season there were new cases from time to time, emanating from the mills. This special origin of small-pox indicates a special and peculiar danger from infectious and contagious diseases to a community in which paper-mills are located, and calls for unusual vigilance and hearty co-operation on the part of the proprietors of such establishments and the citizens."

In reply to inquiries made touching this source of danger, Dr. J. R. Barnett, of Neenah, writes: "I have given the

question of rag disinfection some thought, and in a recent communication to the Secretary of State Board of Health I advised the procuring of legislation compelling disinfection before rags can be handled in paper-mills. As to the particulars of such a bill I have thought but little ; but there can be as little doubt as to the practicability as there is to the desirability of suitable legal restrictions upon the trade in and handling of paper stock. Most of the stock used in the Neenah mills, of which there are four, turning out an aggregate product of ten or twelve tons per day, requiring fifteen to twenty tons of rags, must of necessity come from abroad. The large cities are the depots and principal primary source of supply, because it is in the cities alone that the small economy of rag-picking and saving is reduced to a science ; at least, what is gathered into the ' junk '-shops from the country is turned into the mass and baled up with it, sharing its various kinds and degrees of infectiveness without adding any element of safety. The bales thus sent out of the paper-mills are infernal machines for the dissemination of zymotic poisons. There are few cities of 100,000 inhabitants and over where small-pox is not in perennial bloom. There are consequently few consignments of rags to paper-mills that are not at the same time consignments of potential small-pox to the community possessing the mills. This statement is none the less true because it happens only occasionally that the mill operatives contract the disease. The women in the rag-rooms are exposed to the danger of contagion almost every working day of their lives, and the community is at the mercy of the chance which dooms or spares the rag-women. Safety for the community can be secured only in one way, namely, by the thorough disinfection of rags before they are allowed within its corporate limits."

"Variola caused by Infected Paper Rags," by F. B. A. Lewis, M.D. (Horr), of Watertown, N. Y., *Boston Medical and Surgical Journal*, Vol. I., 1875, p. 647 : "On the first appearance of these cases to be detailed, they were considered by me to be those of rotheln, as described by Drs. Cutting and Swan, but they terminated in an undoubted form of variola." Ten cases are referred to by the writer, and the symptoms described at length. The writer further adds:

"Recurring to the first cases, they are supposed to have been caused by exposure to twenty bales of rags which were brought from California, ten bales having been received January 28th, and ten February 5th. These rags were sorted by twenty-one girls in one large room, seven of whom were attacked at about the same date. The superintendent of the room stated to the writer that the rags were moist, and had a peculiarly disagreeable odor, and many bandages, poultices, some entire articles of underwear, stained as though from the persons of invalids, were found."

The writer has observed that "the vessel bringing these rags to New York City was not quarantined; that the bales were stored with many others which were forwarded to the mills of another county, and, although made into paper, no complaint was entered. Some of the employés here who actually handled the rags were not affected, while others working on other material on the opposite side of the room succumbed to the disease; and even two or three who were in other parts of the mill, but who came into the assorting-room on an errand, took the disease. About forty cases have occurred in all, and thirteen or fourteen have died."

Opinions of Medical Men. From the *Medical Record*, June 20th, 1885. "Rags and Infectious Diseases." Editorial: "The opinion of these health officers, and of the best health authorities generally, is, that imported rags should sustain careful inspection, and, if need be, disinfection. The best method of securing a sanitary history of the rags—and that is what the ship should supply—have not been devised, and therefore some trouble must for the present ensue. It is much wiser and more economical meanwhile to be on the safe side, and Health Officer Smith will get the hearty support of the profession and the laity if he takes firm ground in defence of the public health. It should be remembered that cholera is not the only danger which we must avoid. Whether it has ever been imported in rags or not, other diseases almost as destructive have been so conveyed."

Letter from E. Hoffmann, Austrian delegate to the International Sanitary Conference at Rome, 1885, member of Committee on Disinfectants:

"August 11, 1885.

"VERY HONORED COLLEAGUE: In reply to your highly prized letter, which I received yesterday, I report as follows:

"I hold rags which come from regions infected with cholera exceedingly dangerous, not merely because they may be soiled with cholera defections, but especially because they hold in the interior of the bales the infectious material longer than might otherwise be possible, for the dejections, etc., dry out only slowly, and the warmth favors the growth of microscopic organisms. On the whole, there takes place in this respect the very same process which is also to be observed in single rags, where the infectious material is kept moist a longer time in the folds, or in places where it is more closely laid together, and keeps the microscopic organisms contained therein much longer in a condition to multiply.

"In Austria, whenever the cholera breaks out in another country, the importation of rags is imperatively forbidden. Special regulations about the disinfection of rags do not exist, and only general directions for disinfection are enforced.

"I myself would employ only heat (steam) and complete aëration. It is of the highest importance in this matter to see to it that only thoroughly dried rags are packed in bales and brought into trade. With reference to the so-called 'rag-sickness'—which in my opinion is a form of anthrax, and which affects especially the workers in paper-factories who open bales of rags and perform the first work upon them, sorting and cutting the rags—I have required that the rags, before their manufacture, should be treated with superheated steam, then spread upon a grating and thoroughly dried."

Dr. George M. Sternberg, whose researches and studies in relation to germ-producing diseases have secured him an enviable reputation both in this country and in Europe, writes as follows: "It is difficult to make a general rule which will be just to those engaged in importing rags, without taking any risk so far as the public health is concerned. But it seems to me that there will be less injustice in a rule to which no exceptions are made than in leaving the matter to the individual judgment of the health officers of our several cities. . . . I am satisfied that the below-named infectious material could be transported across the Atlantic in bales of rags without any loss of specific infectious power, viz., articles infected by contact with patients having yellow-fever, small-pox, or scarlet-fever, or with the germs of anthrax (malignant pustule), symptomatic anthrax (black leg), pleuro-pneumonia of cattle,

and tuberculosis. . . . When we consider the degraded condition of the rag-picker in the populous cities of Europe and Asia, and the localities in which their collections are largely made, it seems to be beyond question that infectious material of various kinds must frequently find its way into the bale of rags which is shipped to this country. I am therefore in favor of disinfection of all rags by the very simple but effective method of subjecting them to superheated steam."

The Health Officer of Ypsilanti, Mich., in a report to the Secretary of the State Board of Health of Michigan, says: "Before closing this report, I would desire briefly to allude to the source of the small-pox in this city. In most all cases it has been directly traced to those engaged in picking over rags in our paper-mills. The larger portion of those rags, particularly the best linen 'stock,' are imported in bales from France, Italy, or Germany. One can easily imagine that we have here a never-failing source of contagion, and that these rags, collected from all sources—hospitals, pest-houses, etc., form a germ from which many of our epidemics originate. . . . Cannot some remedy be devised, or some means be introduced, to disinfect these rags previous to sending them on their mission of death and disease through the United States?"

This was written in 1876. It cannot therefore be claimed that this opinion is the result of recent discussions concerning old rags, or from "cholera scare."

In reference to the last case of small-pox reported from Ypsilanti, the Secretary of the Michigan State Board of Health says: "It originated in the rag-room of one of the paper-mills, and proved fatal the third day after the eruption appeared. I am very confident that contagious diseases may be spread in this way. Scarlet-fever is frequently reported in this office as contracted from old clothing disused for weeks or months, but previously in contact with the sick."

If clothing that has been in contact with the sick may convey the contagion of scarlet-fever after "weeks or months," it is much more probable that this disease, or small-pox, the contagion of which may be carried thousands of miles, and infect months after it has been given off by its victim, may be communicated by the rags which are thrown out of the sick-room into the garbage barrel or into the street, and gathered

by the rag-picker with as little scruple and care from the gutters that reek with filth as from the refuse from the residences of the rich.

Dr. T. C. Minor, whilom Health Officer of Cincinnati, in a letter addressed to the *Commercial Gazette* of that city, said: "Nine tenths of the outbreaks of zymotic diseases in the United States may be tracked to the doors of the rag and old-clothes men; and the sooner the American people realize this fact the better for all concerned."

It is generally understood that Dr. John C. Peters has given much attention to the history of cholera. When a reporter asked him recently whether it was likely that cholera could be brought here in baled rags, he is reported to have said: "I should be afraid of them. I should be afraid of those last Japanese rags that they are making such a fuss about, for, although there has been no recent outbreak of cholera in Japan, it prevailed there some years ago; and it is a matter of general knowledge that rags will retain the cholera germ for a long period of time. Of course they will not hold cholera as long as they will small-pox, but we don't want small-pox or any other infectious disease any more than we do cholera. Then, too, it must be borne in mind that even though rags may come from a port where cholera has not prevailed, that is not a guarantee that they do not contain the deadly germs, for people move about from place to place, and from country to country, carrying with them old clothing which afterward go into rag bales. It is therefore quite possible for a family from a cholera district to go into a previously unaffected place, and if they do not develop the contagion there, to send it thence in the rag bale. It has been of frequent occurrence that cholera has been carried to far-away countries in old clothing.

"The history of the breaking out of cholera in Spain last year is interesting, and positively sustains the theory, or fact rather—for so it has come to be accepted—that the disease is carried in old clothing. It all came from one family, that, trying to escape the rigid quarantine, shipped from Marseilles down to Algiers, and from there shipped to Alicante in Spain. Their clothing of course had not been disinfected, and shortly after their arrival the disease broke out in Alicante. It lingered there during the winter, and has since been doing deadly work."

In compliance with the request of the Surgeon-General of the United States Army, Dr. Sternberg gave the following opinion :

BALTIMORE, MD., March, 1885.

To the Surgeon-General U. S. Army, Washington, D. C. :

GENERAL : In compliance with instructions contained in a communication dated March 19th, 1885, and with the request contained in the enclosed communication from the honorable Secretary of the Treasury, I have the honor to submit the following opinion :

My studies relating to disease-germs leave no doubt in my mind as to the possibility of the importation of the germs of cholera, malignant pustule, small-pox, and yellow-fever in old rags, whether baled or otherwise.

The germs of malignant pustule (anthrax) may be preserved indefinitely without losing their virulence, and we have ample evidence that the germs of cholera, of small-pox, and yellow-fever may be preserved in infected clothing or bedding for a considerable time, exactly how long a time has not been determined.

That such infected articles could be preserved in bales of rags can scarcely be questioned ; and it seems apparent that they are likely to find their way into the rag-pickers' collections during the epidemic prevalence of these diseases, especially in countries where there is no organized sanitary supervision. Very respectfully,

Your obedient servant,
GEORGE M. STERNBERG,
Major and Surgeon, U. S. A.

To the Editor of the Evening Post :

SIR : In the *Evening Post* of September 1st you state : "There is no authentic case on record of cholera having been conveyed in rags, but great pains have been taken to alarm the public through the telegraph and press." There is a case in the record of my memory as follows : In the summer of 1849 a whole family, somewhere in Northern Indiana, died with cholera. The clothing of that family was packed late in the spring of 1850, and sent to some relatives in Castalia, O., who opened the box and used the clothing. This latter family was attacked with the disease, the first case there, and through them the cholera spread through that village and the surrounding country, and was very fatal. S. BRUSH.

CANANDAIGUA, N. Y., Sept. 3, 1885.

Dr. L. A. Sayre, formerly resident physician of the city of New York, when asked what articles he was particularly suspi-

cious of, is reported to have said: "Well, more than anything else, the packed-up clothing of immigrants, and the rags that were brought from infected districts. That last, by the way, is a matter that should concern us very much about these days, if there are to be any importations from the neighborhood of Marseilles, Madrid, and other infected localities or ports where transhipments from such ports could be made. Not only would there be danger now, but for many months to come."

Revue d'Hygiène, Paris, May 20th, 1885, by Dr. G. Pouchet, page 392: "When we think of the varieties of merchandise coming from abroad, and their more or less prolonged stay in the warehouses, or the masses, often considerable, accumulated in damp places, which favor the development of inferior organisms, we have reason to be surprised that their immediate use does not more frequently occasion contagious diseases or local troubles, such as phlegmons, an example of which I saw in a workman, who, having an excoriation of his hand, wrapped the injured part in a piece of rag, apparently clean. Our colleague, Dr. Napias, related, in his excellent *Manuel d'Hygiène Industrielle*, epidemics of small-pox breaking out among the workers manipulating old rags."

British Medical Journal, Vol. II., 1884, page 629, September 27th, 1884. Imperial Board of Health, July 29th, 1884. "Concerning the case quoted by Professor Leyden, Professor Hirsch said that, in the town of Mühlhausen, in Thuringia, there were nine cases of cholera, four of them proving fatal, in the cholera epidemic of 1873, all of which, with the exception of one case, belonged to one house. The house was inhabited by six families, numbering twenty-three persons, three of the families, numbering eleven, inhabiting the basement floor. Behind the house was a drain of a closet which was used only by the inhabitants of the basement, other water-closets existing for the inhabitants of the lower stories. The first case, which took place on August 26th, was that of a woman who had come a few weeks before to Mühlhausen from St. Louis, in the United States of America, *via* New York, Hamburg, and Bremen, but had only just received the things brought with her from America about the beginning of August. Among these effects were some soiled linen, which she sent to be washed, and some confectionery which she and her sister,

in whose house she was living, partook of. A few days afterward the new-comer was attacked with cholera ; then her sister ; her child and her grandmother also had severe attacks of diarrhœa, and soon afterward cases of cholera occurred among the other families inhabiting the basement—so that, out of the eleven persons inhabiting the basement, only two escaped the disease, and four died of it ; while of four among the inhabitants of the upper stories, who had afforded the sick persons assistance, and also took charge of the old woman and the child, who had become ill, not one case of cholera occurred. That at the time when the effects left St. Louis cholera had been raging especially severely, in the quarter of the town, too, from which they came, has been accurately proved. The appearance of cholera in that house in Mühlhausen, where there had been no case till then, after the arrival of the luggage, induces the reporter of the case to believe that the specific poison of the disease was introduced with the baggage, and that the further spread of the disease among those inhabitants of the basement who had not come in contact with the things was explained as infection from the closet used in common by the inhabitants of the basement, the dejecta of the first patient having been thrown into it."

Dr. Hirsch said : "An interval of from four to six weeks between one case of cholera and the outbreak of an epidemic caused by personal effects was completely reconcilable with Dr. Koch's views."

Dr. Koch possessed dried anthrax material which was still efficacious after twelve years. In small-pox, infection sometimes took place after a year, or longer, and the vaccine could be preserved in a dry state for years. Linen packed together could still remain damp after the lapse of some weeks, and thus contain vital comma-baccilli.

Annales d'Hygiène Publique, March, 1885. By Professor Brouardel. Preservation of Europe from Exotic Diseases. Extract, page 241. "The linen which has been polluted by the dejecta of cholera patients is a powerful agent of propagations, sometimes direct, when, by the contact of the hands one carries the germ to the food, when one breathes the effluvia, or indirect when the people drink the water below the washhouses. In order that you may understand the importance of this question, let us cite two examples : page 142. 'The epi-

demic of Yport : The sailors arriving from Newfoundland, absolutely healthy, debarked at Hetta, where the cholera was raging. Some died. They decided to return by the railroad to their native country, Fécamp and Yport. One of them died at Parascon ; his trunk continued the route, remained eight days on order at Paris, went to Yport, an old woman opened it, emptied it, and washed the clothes. She died two days after, and created a focus far from all communication with any other centre. The soiled linen had been the only means of contact.' "

RAG-PICKERS' DISEASE.

Extracts from Foreign and Home Journals. (*Annales d'Hygiène Publique*, 1879, Vol. II., page 480.) The physicians of lower Austria have observed recently a disease, the nature of which remains unknown, that they have only met in the paper-factories, and which they call the rag-pickers' disease (Die Handernkrankheit). The disease commences with weakness, anorexia, insomnia, vomiting, sensation of weight in the epigastrium the second day, sometimes the third ; one can see cyanosis of the lips, cheeks, nails, cold sweats, œdema of the lungs, no disturbance of the brain. Generally death is easy, excepting in cases where there is pulmonary stasis. No abdominal symptoms, no albumen in the urine. On necropsy one finds various lesions of the lungs without special character. This is the disease Dr. Hoffmann, the Austrian delegate to the Rome International Sanitary Conference, refers to on another page as " rag-sickness," and which he believes to be a " form of anthrax."

Extracts from the report of Dr. Bristow, taken from the eighth report of the Medical Officer of the Privy Council, pages 206–7 : " Mr. Barnard, upon opening a bag of rags, noticed a disagreeable odor, and fourteen days (or thereabouts) after was seized with small-pox. He recognized the same odor while the scabs were falling off. No small-pox in the vicinity previously. Saunders (a female rag-sorter) took small-pox from Temple Mills, Marlow ; four others had it at nearly the same time. All five were engaged on dirty London rags. She was attacked in two weeks. No small-pox in the village at the time. Mrs. Hays says while cutting up rags she recognized the smell of small-pox, and two or three weeks afterward she took the disease. She claims that the rags were from Tun-

bridge Wells, where small-pox was prevailing at the time. There was no small-pox in her neighborhood at the time. Mrs. Holland had small-pox, which she attributed to some London seconds she had been cutting up. Eight other cases broke out subsequently in the mill. There was in the neighborhood one Henry Styles, a carrier, who had the disease previously; he died of it a week or two before she took it, but he lived three fourths of a mile away, and had no communication with her."

Surgeon-General Murray, who served many years in India and made extensive researches, states that according to returns received there was an almost unanimous belief in the communicability of cholera. Those who believed in a spread from person to person amounted to 75 per cent of the whole number; from place to place, 85 per cent; by evacuations, 92 per cent; and by clothing, 98 per cent.*

Dr. I. H. Taylor, chairman of this committee, when the "preliminary report" was under discussion at the meeting in Washington, says: "Two distinct outbreaks of small-pox near Spring Mills occurred among the operators in one of the manufacturing establishments there, from baled rags. The rags came from New York." †

Professor Joseph H. Raymond, late Health Commissioner of Brooklyn (and member of this committee), has furnished your reporter with the following analysis of evidence in response to inquiries made in the exercise of his office, which was at hand last year, but prohibited by the "previous question" to refer back the preliminary report.

"Summary of replies to circular letter addressed to boards of health and paper-mills: Boards of health responded: American, 28; foreign, 10; total, 38. Number of boards of health that have known of contagious diseases from rags: American, 14; foreign, 5; total, 19. Number of boards of health not knowing of contagious diseases from rags: American, 14; foreign, 5; total, 19.

"Nature of contagious diseases above referred to: Small-pox, 71 cases and 24 epidemics; cholera, 1 case; scarlet-fever, 3 cases and 2 epidemics; typhoid-fever, 1 case.

* Went's "Asiatic Cholera," p. 206. † "Public Health," vol. xi., p. 377.

"Health Officer of Yonkers believes scarlatina, measles, and whooping-cough may be contracted from rags.

"Health Officer of Hamburg believes that small-pox, scarlet-fever, typhoid-fever, cholera, yellow-fever, and glanders may be contracted from rags, and reports case of malignant pustule, and several cases of small-pox.

"The health boards are unanimous in their belief in the danger of infection from rags, and the necessity of disinfection. Those who do not report cases are mainly from places where there are no paper-mills.

	American.	Foreign.	Total.
Number of paper-mills that responded to circular for information	84	27	111
Number that have known of contagious diseases in paper-mills	24	3	
" " have not known of contagious diseases in paper-mills	60	24	
" " believe that rags may carry infection	35	10	
" " believe in disinfection of rags	16	1	
" " do not answer as to disinfection of rags	33	25	
The disease reported is invariably small-pox.			

"Of those who report contagious diseases in paper-mills many do not believe it attributable to rags; others report that it was due to domestic rags. The foreign mills, with one exception, report the disease as occurring in other mills than their own. Several believe that contagion can be carried by second-hand clothing and the baggage of emigrants. Six believe the danger from rags is very small and much exaggerated. Several believe that domestic rags may infect, but are very sure there is no danger in foreign rags."

The evidence now adduced, though far from being all that could be, in favor of the propagation of infectious diseases by rags and their congeners, is deemed to be sufficient to satisfy the scruples of all persons, professional or otherwise, who do not allow other interests than the public health to sway their opinions. It would be a waste of effort to undertake to satisfy such persons, and they may well be dismissed from present consideration with the words of the eminent Dr. Richter, of Germany, whose voice was long since raised against rags as the fruitful source of contagious disease, who says: "When man's own interests are at stake, he does not care at all for his

fellow-beings, whether in adversity or prosperity, and for a farthing he will put all the people's health in jeopardy."

It is conclusively shown that cholera, in proportion to its prevalence outside of India, is no less liable to propagation by rags and clothing than small-pox and other infectious diseases. "But," observes Dr. H. B. Baker, Secretary of the State Board of Health of Michigan, in a recent communication to the editor of THE SANITARIAN (Vol. XVII., p. 61), "small-pox is not the disease most to be dreaded by our people; and, judging by past experience, cholera is of small consequence compared with those diseases which, when once introduced, tend more strongly than do those diseases to remain, and continue to swell the date-rates. In the year 1880 small-pox is reported to have killed only 871 people in the United States, while scarlet-fever killed 16,416, and diphtheria killed 38,398.

"In Michigan, in a long term of years, the mortality from scarlet-fever is about eight times, and from diphtheria, about sixteen times greater than from small-pox. In Europe, also, the mortality from scarlet-fever and diphtheria is large compared with that from small-pox. Taking up at random monthly reports from the province of Madrid, Spain, I find that in August, 1883, the deaths from diphtheria were 83; scarlet-fever, 18; small-pox, 24. August, 1884, deaths from diphtheria in the province of Madrid, Spain, 120; scarlet-fever, 20; small-pox, 9. December, 1884, diphtheria, 118; scarlet-fever, 8; small-pox, 19. Pursuing the same course with Copenhagen, Denmark, I find that in October, 1885, there were, of diphtheria, 455 cases; of scarlet-fever, 526 cases; and of small-pox, 16 cases. In November, 1885, of diphtheria, 536 cases; of scarlet-fever, 547 cases; of small-pox, 7 cases. In December, 1885, there were, of diphtheria, 633 cases; of scarlet-fever, 595 cases; and only 28 of small-pox. In the next month, of diphtheria there were 703 cases; of scarlet-fever, 624 cases; and of small-pox, 5 cases.

"I do not suppose that many unprejudiced persons will now dispute that diphtheria and scarlet-fever are conveyed, among other means, by clothing; and that imported rags, coming as they do from so many places, from the homes of the people where those diseases are constantly occurring, can be the cause of outbreaks in this country. The presumption

is, that in every large lot of rags, gathered as they are, some will be likely to be infected with the causes of those diseases, because the diseases are so widely distributed and are so constant. There is not a country in Europe free from them any week of the year, and there is not a large city that is now ever free from them. In the table in THE SANITARIAN, June, 1886, page 567, you show that diphtheria was present in forty-seven of the cities of Europe during January, February, and March, 1886, and I can add Madrid, Rome, and Copenhagen. Your table includes all of the countries which I have previously named, also Ireland, Sweden, Norway, and the Netherlands. Scarlet-fever, according to your table, was present in forty-four of those cities, to which also can be added Madrid, Rome, and Copenhagen. In the March number, 1885, you show that diphtheria and scarlet-fever were present during the year 1884 in forty-eight of the large cities of Europe, and the figures are so large as to make it certain that those diseases are constantly making havoc among the people.

"Cases of small-pox in this country have been traced to rags, but I do not know that any attempt has been made to trace diphtheria and scarlet-fever to them; yet I consider the danger of our getting diphtheria and scarlet-fever from such rags much greater than of small-pox. Small-pox is more easily traced than are the other diseases; it is never so subtle and mysterious, while, strange to say, it yet causes greater popular apprehension, which makes a discovery of the source of contagium more certain. We know that immigrants from Europe having diphtheria and scarlet-fever, or carrying the contagium in their clothes, land in New York every year. Speaking of scarlet-fever, the Fifth Annual Report of the State Board of Health of New York (page 5) says that the cities of New York and Brooklyn, 'as might be expected from their constant influx of immigrants,' bear the principal brunt. But such diseases spread so easily that they are not confined to either of those cities; they spread throughout nearly this entire country.

"In considering this question of disinfecting imported rags, it is well, then, to remember these points:

"1. Diphtheria and scarlet-fever are very much more destructive everywhere than is small-pox.

"2. Diphtheria and scarlet-fever are never absent from any European country.

"3. Rags collected from the homes of the people of Europe are more likely to convey diphtheria and scarlet-fever than small-pox.

"4. The sooner public attention is attracted to the many ways in which those diseases—scarlet-fever and diphtheria—which actually destroy our people by the thousands, are introduced and spread, especially throughout the Northern States, the sooner will it become practicable to prevent the introduction of those diseases.

"5. If United States consuls could have, as we have, through our system of exchanges, the knowledge relative to the presence of the really dangerous diseases in each of the foreign cities and countries, it would probably be impossible for them to truthfully give such a certificate as is required by the resolution of the New York Chamber of Commerce. The last clause of the first resolution adopted by the chamber should then be operative. It reads as follows: 'In the absence of such certificate, rags coming from a port or country claimed to be free from such diseases shall be disinfected on arrival.'"

With these views the undersigned cordially agree, and therefore respectfully recommend so much of the preliminary report of the committee last year as is hereto annexed, marked A; and also recommend as an appendix to this report the "Résumé" of the subject, by Dr. William M. Smith, Health Officer of the Port of New York, marked B.

(A)

The Special Committee, to which was referred the resolutions of the Philadelphia Board of Health touching the importation of infected rags, begs leave to submit the following preliminary report:

Whereas, It is an admitted fact that the importation of rags is a prolific source of the spread of infectious disease, and that the seaboard cities which are ports of entry are the gateways through which this infection enters and is distributed throughout various sections of the country; and,

Whereas, There are grave doubts as to the efficacy of the methods of disinfection used abroad; therefore,

Resolved, That it is the judgment of the American Public Health Association that all health authorities having jurisdic-

tion over matters connected with maritime sanitation owe it as a duty to the general public to adopt such systems of disinfection as will thoroughly destroy all disease-bearing germs before the rags are permitted to be distributed for manufacturing purposes. If it proves to be impracticable to disinfect them, it is recommended the disinfection may be commenced in quarantine sufficient to insure safety in transportation, to be completed in the manufacturing establishment by such methods as the health authorities may prescribe.*

(Signed) J. HOWARD TAYLOR,
A. N. BELL,
H. B. HORLBECK.

WASHINGTON, Dec. 11, 1885.

A. N. BELL, M.D., *Chairman.*
HENRY B. BAKER, M.D.,
Secretary of State Board of Health of Michigan.
JOSEPH HOLT, M.D.,
President of State Board of Health of Louisiana.
JOSEPH H. RAYMOND, M.D.,
Professor of Physiology and Sanitary Science, Long Island College Hospital, and late Health Commissioner of Brooklyn.
H. B. HORLBECK, M.D.,
Health Officer of Charleston, S.C.
J. HOWARD TAYLOR, M.D.,
Medical Inspector, Health Department of Philadelphia.
C. W. CHANCELLOR, M.D.,
Secretary of State Board of Health of Maryland †

TORONTO, Oct. 5, 1886.

(B)

RÉSUMÉ.

SANITARY AND HEALTH ORGANIZATIONS.

SUMMARY.

Of reports and recommendations in relation to and expressive of the danger of contagious diseases from rags, contained in the brief of the health officer submitted to the Com-

* The last clause of this resolution, beginning with "If it proves," was added by the Executive Committee. They also struck out the word "uniform" before the word "system" in the third line, and the resolution as amended was adopted by the Association.

† Dr. Chancellor, being in Europe, has not seen this report, but the chairman of the committee feels so confident of his approval from previous communication with him, that he has assumed the responsibility of adding Dr. Chancellor's name.

mittee of the Chamber of Commerce, appointed to investigate the rules and regulations of the health officer of the port in relation to the disinfection of rags :

1. The Conference of the State Boards of Health at Washington, D. C., in 1884.
2. The Conference of the same body in 1885.
3. The Treasury Department of the United States adopted and enforced the recommendation of the conference of 1884, until June 10th, 1885.
4. The Ordinance of the Boston Board of Health, that requires the disinfection at that port of all rags that enter.
5. The Recommendation of the Fifth Avenue Hotel Conference, May 23d, 1885.
6. The State Sanitary Convention held at Philadelphia May 13th, 1886.
7. The Sanitary Congress of The Hague of 1884, which pronounced rags "a danger, national and international."

MEDICAL JOURNALS AND OFFICIAL REPORTS

That refer to cases of contagious or infectious diseases communicated by rags, or that refer to the danger from them :

1. State Board of Health of Michigan, 1882, p. 393.
2. Sixth Annual Report of State Board of Health, Connecticut, p. 22.
3. Secretary's Report in same, p. 225.
4. State Board of Health, Michigan, 1881 ; also, p. 295 of same.
5. Fifth Annual Report of Massachusetts State Board of Health, 1877, p. 548.
6. State Board of Health of Connecticut, Fourth Annual Report, 1881.
7. State Board of Health of Michigan, p. LXII.
8. Annual Report State Board of Health, 1882, pp. 53, 58.
9. Report of Special Inspector W. B. Atkinson, M.D., to Secretary of State Board of Health of Pennsylvania.
10. *British Medical Journal* of May 11th, 1878, p. 686.
11. *British Medical Journal*, Vol. I., p. 863.
12. *British Medical Journal* of July 3d, 1880, Vol. II.
13. *British Medical Journal* of January 20th, 1883.
14. Annual Report of Local Government Board of England, 1883, 1884.
15. *British Medical Journal*, August 4th, 1883.
16. *British Medical Journal*, May 2d, 1885.
17. *National Board of Health Bulletin*, Vol. I., No. 44.
18. Massachusetts State Board of Health, 1873, p. 463, reporting 192 cases of small-pox originating at paper-mills of that State in 1872 and of February of 1873.

19. Second Annual Report of Wisconsin State Board of Health for 1877, pp. 140, 141. Also supplementary report of same volume, p. 95.

20. *Boston Medical and Surgical Journal*, 1875, Vol. II., p. 647.

21. In answer to ex-Health Commissioner J. H. Raymond's inquiry, 19 boards of health replied that they had known of 71 cases of small-pox, and therefrom 24 epidemics of that disease, 1 case of cholera, and 2 epidemics of scarlet-fever from rags.

22. *British Medical Journal*, Vol. II., 1884, p. 629. (Cholera in Germany by clothing from the United States.)

23. *New York Journal*, August, 1885. Account of 17 workmen who took cholera from rags, 11 of whom died.

24. *New York Medical Record*, June 20th, 1885.

25. *British Medical Journal* of August 25th, 1883, p. 397, refers to importation of disease by rags.

26. August 15th, 1883, member of House of Commons called attention of Local Government Board to small-pox imported by rags.

27. *British Medical Journal* of 1880, Vol. I., p. 952, reports epidemics of small-pox from rags that had been on the place six months.

28. *Annal d'Hygiène Publique*, 1879, Vol. II., p. 480, describes the "rag-pickers' disease," prevalent in Lower Austria.

29. Eighth Report of Medical Officer of Privy Council, England, refers to numerous cases of small-pox from rags among operatives of paper-mills.

30. *Revue d'Hygiène* of May 20th, 1885.

31. In *Manuel d'Hygiène Industrielle*, Dr. Napias relates epidemics of small-pox among workers in old rags.

32. A French decree, March 15th, 1885, compelled the disinfection of rags and paper rags, and the importation was compelled to pass through four ports where disinfection was provided.

33. M. Lecourteux and Garnier, large manufacturers in France, in St. Oberkampf, steam their rags in copper boilers before distributing to workmen.

34. The New York *Times*, February 6th, 1886, reports cases of small-pox originating in handling rags in a paper-mill (Adams's).

OPINIONS OF MEDICAL MEN.

1. Dr. Griswold, of Connecticut, reports six malignant cases of scarlet-fever (four fatal) conveyed to patients through rags.

2. The Secretary of the State Board of Health, Michigan.

3. The Health Officer of Ypsilanti, Michigan.

4. Dr. T. C. Minor, formerly Health Officer, Cincinnati.

5. Dr. E. Hoffmann, Austrian delegate to International Sanitary Conference at Rome.

6. Dr. George M. Sternberg, U. S. A.

7. Dr. Sayre, of New York City, and 200 physicians of the city of Brooklyn, advise that rags be disinfected.

8. Four hundred physicians of New York City urge that the Health Officer of New York thoroughly purify such merchandise as rags on arrival at this port.

9. Dr. Ruijsch, of The Hague, declares them a danger, national and international.

10. Dr. Pouchet, M. Vallin, M. Olliver, M. Gabriel, and M. Pasteur, eminent French authorities, speak of the danger of disease from rags, or discuss the best means of disinfecting them.

SUMMARY OF CASES.

1. A rag-picker from Amsterdam introduced cholera into the city of Tilburg.

2. At Dresden a rag-picker was the first victim in that Commune.

3. At Mearsen the first one attacked with cholera was a rag-picker.

4. At Wormerveer, in 1886, rags communicated typhus-fever to various people.

5. In the canton of Solothern, 17 workmen, of whom 11 died, were seized with cholera, who were engaged among rags in the paper-mills. There was no cholera within the canton, and the rags came from a cholera district.

6. A sailor died of cholera in Europe ; his clothing sent to Maine (U. S.) communicated the disease.

7. Cholera was introduced at Carthage, O., Crow Run, Minn., and Yankton, Dak., by the baggage of immigrants.

8. Nine cases of cholera, four of which were fatal, occurred at Mühlhausen (Thuringia) in 1873, was introduced by clothing brought by a woman from St. Louis, in the United States, *via* Hamburg and Bremen. Rags in bale have much better condition for preserving contagion than baggage.

SUMMARY OF CASES OF SMALL-POX, ETC.

1. The Report of the State Board of Health of Massachusetts, 1873, shows that 192 cases of small-pox originated in the paper-mills of that State in 1872 and February of 1883.

There is really little difference of opinion among medical men as to rags being the most filthy of commercial products, and dangerous to human life and health.

The authorities referred to cover reports of hundreds of

cases, and numerous epidemics of contagious diseases, both in Europe and America, that have been communicated by rags.

It is not that disinfection of rags is not necessary, but how to do it effectually and economically.

It has been and is being done by the sulphur process *before* baling. It has been and is being done by boiling before baling. Fifteen sixteenths of the 160,000 bales imported at New York during the year past have been disinfected by that process. This process, however, has been greatly discredited by reports of inefficiency in its management.

It has been and is being done by superheated steam *after* baling.

The process whereby rags in bale may be disinfected by dioxide of sulphur in vacuum was approved by the Health Officer at New York.

The first-mentioned process has been discredited to some extent by the representations as to the inefficiency of the management.

The second has been and is approved, after numerous experiments by the most intelligent experts and medical authorities.

The third of a series of experiments has proved to be efficient in destroying the disease-germs known and believed to be the cause of certain diseases of the human race.

INFECTED AND NON-INFECTED RAGS.

The effort to distinguish rags that are dangerous from those that are not is not only difficult, but often impossible. Transhipments are too frequent; the temptation to deceive the health authorities too great. The localities in which contagious diseases exist are often not reported. Some of the most destructive to human life, such as small-pox and typhus, always prevail in every country to a greater or less extent. If prohibition was the rule in such conditions, a large portion of every country would be prevented from shipping rags.

Disinfection of all rags would be far more satisfactory. This conclusion is arrived at by many authorities, among whom may be mentioned Dr. George M. Sternberg, Dr. J. H. Hill, Inspector on Consular Staff at London, the United States Consul at Bristol (England), and the editor of the London *Lancet*.

The assumption that domestic rags alone communicate disease is preposterous, and that manufacturers have never known any case of disease caused by foreign rags is incredible. Foreign rags are far more dangerous than domestic, because contagious diseases prevail to a far greater extent among the crowded populations of the Old World. London alone had more cases of small-pox in 1884 and 1885 than occurred in the

whole United States during the same period. Italy at this time is scourged with small-pox to an unusual degree. The same may be said of Southern France.

The evidence that the contagion of cholera, small-pox, and other diseases may be vitalized by contact with persons months after it is communicated to textile fabrics, such as rags and clothing, is voluminous.

There is no doubt that domestic rags are a source of danger, and that they should be disinfected; but because they are not is no reason why the danger from foreign rags should not be removed.

WILLIAM M. SMITH, M.D.,
Health Officer Port of New York.

(C)

DR. STERNBERG'S LETTER.

[The following letter was transmitted to the secretary by the chairman of the committee, Dr. A. N. Bell, with an accompanying letter from Dr. J. H. Raymond asking that the communication of Dr. Sternberg be published in connection with the report of the committee. A copy of Dr. Sternberg's letter was submitted to each member of the committee, and a majority—Drs. J. Howard Taylor, H. B. Horlbeck, Joseph H. Raymond, and Joseph Holt—asked that it be published with the report presented at the Toronto meeting. The question of so publishing was submitted to the Executive Committee, and a vote in the affirmative was received.—SECRETARY.]

JOHNS HOPKINS UNIVERSITY,
BALTIMORE, MD., Dec. 22, 1886.

DEAR DR. RAYMOND: I am much obliged to you for sending me the proof of the Report of Committee on the Disinfection of Rags, and gladly avail myself of the opportunity you give me for placing on record my most recent conclusions with reference to the necessity for disinfecting old rags imported into this country. I had intended to take part in the discussion of this report at the Toronto meeting of the American Public Health Association, but circumstances prevented me from being present at the evening session when this report was read and discussed.

I find that I am quoted quite extensively in the report; and I think it proper that I should state my present views, as I am not by any means as positive with reference to the necessity

for disinfecting *all* rags as I was two years ago. I have since had an opportunity to make a personal inspection of the large establishments in several European cities where rags are baled and shipped to this country. At the request of Dr. William Smith, Health Officer of New York, I made inspections at Ghent, Brussels, Berlin, and Stettin. I also obtained reliable information as to the methods pursued in Hamburg and other German ports from which rags are shipped to this country.

I had previously supposed that rags from ports in Southern Europe, where cholera was prevalent, were liable to be shipped from any of these ports. But all of the merchants with whom I conversed assured me that this could never occur on account of the low price of rags as compared with the cost of land transportation. As a matter of fact, rags sent to each shipping port can only be collected within a limited area, the boundaries of which depend upon cheap transportation facilities, by canals, rivers, etc.

Again, I learned that all rags shipped to this country are first sent to large warehouses in the shipping ports, where they remain for a longer or shorter time, often for many months, usually loosely piled up in open bins. These warehouses of the rag-merchants are in populous cities, and it is evident that the first danger of infection is incurred by those who handle the rags for the purpose of sorting and baling them, and by the citizens of the cities in which the warehouses are located. These cities have their health officials, who naturally have an eye on the warehouses in question, and we would expect to see some restrictions placed upon the business of these rag-merchants if experience had demonstrated that their establishments were dangerous to the public health. I could not learn that, under ordinary circumstances, and in the absence of a prevailing epidemic, any restrictions were placed upon this business, or that any were considered necessary.

The fact that rags shipped to America are carefully sorted in these large warehouses, in populous cities, by women and children who come to the warehouse every morning and return to their homes when their day's work is done, gives us data available for estimating, in a general way, the danger of handling rags. To a certain extent these people serve as a test of the possible infectious character of the rags which they handle.

The outbreak of any epidemic due to their occupation could scarcely fail to attract the attention of the local health authorities, and to lead to official inquiry and the carrying out of the necessary measures of disinfection, etc., for their own protection. I would not be understood as advocating a reliance upon the test furnished by the rag-sorters of the shipping ports, and the vigilance of the local sanitary authorities during the prevalence of any epidemic disease in Europe. Information might reach us too late, and the very rags which had given rise to an outbreak of disease among these rag-sorters, or their associates, might be opened at one of our paper-mills before we had received information of the outbreak at the shipping point.

It is, however, apparent that our danger is less than that incurred at the shipping point, and that, to a certain extent, the sanitary condition of these rag-sorters may serve us as a test of the danger we incur in receiving the rags which have passed through their hands. I made inquiries with reference to the general health of these rag-sorters, and also endeavored to ascertain if any outbreaks of infectious disease among them could be traced to their occupation. So far as I could judge from a personal inspection, and from the information furnished me, they presented no evidence of ill-health due to their occupation, and I was not able to obtain any facts bearing upon the transmission of infectious diseases to these people in the pursuit of their daily avocation. I do not, however, attach much importance to the negative results which attended my own inquiries. My informants were, for the most part, those engaged in the business of collecting and shipping rags, and due allowance must be made for the fact that they were interested parties, and that they were not necessarily well informed as to the sanitary history of their employés.

I attach more importance to the fact that the local sanitary authorities do not demand the disinfection of rags brought to these warehouses, and, apparently, do not consider them a serious element of danger.

The Report of the Committee on the Disinfection of Rags, which is before me, is extremely valuable for the reason that it contains the available positive evidence relating to the transmission of infectious diseases by old rags. So long as we had

no collections or data of this character to guide us, it was necessary to be guided by *a priori* arguments based upon our knowledge of the nature of infectious material, and known facts relating to the ordinary modes in which these diseases are communicated. My letter to the surgeon-general of the army, written in March, 1885, which is quoted in full in the report of the committee, contains an opinion based upon such data alone. I see no reason to change my opinion as therein stated. Indeed, it receives support from the record of facts collected by the Committee on the Disinfection of Rags. But the question is not simply as to the possibility of the transmission of the diseases mentioned, but also as to the frequency of their transmission in this way, and as to what action we shall take in view of the facts regarded in a broad way, and taking into consideration sanitary interests, commercial interests, the practicability of proposed methods of disinfection, other possible measures of prophylaxis, etc.

I believe that there is a unanimity of opinion among sanitarians in this country and in Europe as regards the necessity of excluding or disinfecting all rags collected in or shipped from countries in which cholera is prevailing; and the same may be said of yellow-fever. We cannot afford to take any chances with these devastating, pestilential diseases, for we have ample evidence that they may be communicated by the soiled clothing of the sick, or that such infected clothing is dangerous for a considerable period of time. Notwithstanding the limited number of observations relating to the transmission of these diseases through the medium of old rags, no one would be hardy enough to recommend their unrestricted admission from countries in which these diseases are prevailing. The question here is between disinfection and total exclusion. So far as cholera is concerned, the nations of Europe have, for the most part, decided in favor of the exclusion of rags from countries known to be infected or believed to be dangerous. This is, perhaps, the wisest course, as it is certainly the safest. But if it is decided to disinfect we must answer the questions as to where and how this shall be done. My colleagues on the Committee on Disinfectants of the International Sanitary Conference of Rome (1885) were unanimous in regarding steam under pressure as the only reliable agent for the accomplishment of

this purpose. My own experiments, made at the request of Dr. Smith, Health Officer of New York, in the spring of 1885, had convinced me of the practicability of disinfecting rags in the bale by injecting steam under a high pressure through a number of perforated metal screws, *on condition that the bale was placed in a steam-tight receptacle during the operation.* As to the practicability of so disinfecting rags in the bale, from an economic point of view, I have never given an opinion because I have not had the necessary data upon which to form one. The rag-merchants in Europe at the time of my visit insisted with great unanimity that the process injured their rags, and seriously impaired their market value. It is a question, also, whether in practice it is possible to keep those who are entrusted with the application of the method up to the conditions established by the first experimental test. If the bale is not enclosed in a steam-tight receptacle, the steam from the perforated screws will find the shortest and easiest way out, and certain portions of the bale may escape complete disinfection. Evidently it would be a much simpler matter to disinfect rags before they are baled in a suitably constructed chamber into which steam could be admitted at any desired pressure. This would involve their disinfection at the shipping port. I was informed by the large rag-merchants in Berlin and other cities which I visited that they would gladly construct a suitable apparatus if they knew exactly what we required, and if they had any assurance that we had adopted a settled policy. But I should not place any great dependence upon disinfection practised abroad, unless we could have a reliable inspector upon the spot. Disinfection with sulphurous-acid gas, as now practised at the shipping ports which I had an opportunity to visit, I look upon as a farce. It is practised simply for the purpose of escaping the steam disinfection process at this end of the line, and is looked upon by the rag-dealers and health authorities of European cities as unnecessary and inefficient. The latter it certainly is, as I saw it practised, and the inspectors appointed by our Government to see that it was done in accordance with prescribed regulations had no more confidence in the utility of the procedure than I had. Taking all of the circumstances into consideration, I think it will be prudent for us in future to adopt the policy of England and of the leading

nations of the Continent of Europe, and to exclude rags from cholera-infected countries, rather than to trust to their disinfection either before shipment or at the port of arrival. The evidence collected by the Committee on the Disinfection of Rags shows that the disease which has been most frequently transmitted by this medium is small-pox. The question whether we, as sanitarians, shall demand the disinfection of all rags imported into this country, must be decided with reference to this disease. For if we leave out of consideration the widely extending pestilential diseases already considered—cholera and yellow-fever—we have no evidence upon which to justify a demand for the disinfection of all rags except that which relates to small-pox. It is true that anthrax has been communicated to the employés of paper-mills in Austria through the medium of rags; but our danger from this and other diseases which depend upon inoculation—*e.g.*, syphilis—is hardly worthy of consideration. At the most, an individual may occasionally suffer from one of these diseases as a result of his occupation, but the risk taken by those occupied in paper-mills of suffering accidents of this kind is probably less than the risk of physical injury taken by operatives in mills, by railroad employés, and mechanics generally. We must deplore these accidents to individuals, but we are hardly justified in interfering with the branch of industry with which they are concerned upon such grounds. It is only when the sanitary interests of the community and of the general public are involved that we are justified in recommending general measures of prevention. As sanitarians, but more especially as humanitarians, we should do everything in our power to reduce the mortality from accidental causes in factories, mines, etc., by insisting upon such safeguards as science and experience suggest. But it seems to me that our functions cease here. Employers should be held to a strict accountability that all proper precautions are taken for the protection of the lives and health of their employés. Their responsibility should be established by legal enactments in the several States, and specific regulations should be devised for the protection of all workmen who are engaged in occupations in which they are especially liable to accidental injury, or to impairment of their general health.

Returning to the evidence contained in the report before me relating to the transmission of small-pox, I should say that this evidence is ample to justify the demand that all rags shall be disinfected upon their arrival at our ports, if *there is no other and simpler method of accomplishing the same end—i.e.*, the protection of the employés of paper-mills and the general public from this disease. But, fortunately, we have other means of protection against the disease in question. A properly vaccinated community is practically safe from the ravages of small-pox, and it is generally admitted that the occasional outbreak of local epidemics of this disease is due to neglect of this precious means of prophylaxis.

It seems to me that, in view of the data collected by the Committee on the Disinfection of Rags, it is incumbent upon us as sanitarians to insist upon the proper protection of all those who are brought by their occupation in contact with old rags. If this is done, the danger will be reduced to a minimum ; and if the community is fully protected in the same way, as is the case in Germany, for example, there will be no good reason for disinfecting rags in the bale.

I take it for granted that the virus of small-pox, anthrax, or syphilis, attached to old rags, is out of the way of doing harm so long as these old rags are packed away in a bale, and that the danger from baled rags *in transit* is hardly worthy of consideration. But if a bale as a package of merchandise is considered dangerous, it could easily be disinfected externally by placing it in a proper receptacle, and subjecting it to the action of steam at a temperature of 230°–250°. Such external disinfection of bales should be practised when there is any reason to suppose that they may have become infected *in transit*, by passing through seaport cities, or by being transported on ships infected with cholera, yellow-fever, small-pox, or any other infectious disease. This would not be expensive, and certainly would not materially injure the rags.

Finally, I would say that I consider it *desirable* that all old rags should be disinfected by steam and then thoroughly dried before they are packed in bales. This should be done as soon as practicable after they are received from the collectors at the storage warehouses, whether in this country or abroad. During the prevalence of cholera in Europe I would exclude all

old rags shipped from ports known to be infected, or in direct communication with infected places.

I would *require* all rags shipped from a healthy port during the prevalence of cholera in Europe to be disinfected by steam before they were baled for shipment.

In the absence of any prevailing epidemic I would not treat baled rags differently from other merchandise. If for any reason the health officer at the port of arrival considers such merchandise dangerous, it is evidently his duty to disinfect it. This can be done most effectually by steam.

Inasmuch as I have been largely quoted in the report of the Committee on Disinfecting Rags, I think it desirable and proper that my present views upon the subject, as embodied in this letter, may be published in connection with your report.

Very sincerely yours,

(Signed) GEORGE M. STERNBERG.

VACCINATION AND THE ANTI-VACCINATORS.—The London Society for the Abolition of Compulsory Vaccination has adopted a resolution to the effect that, inasmuch as vaccination has been "the means of spreading dangerous and infectious diseases," and that this is no longer denied by the heads of the profession, it is the duty of medical men to petition Parliament for the repeal of the Vaccination Acts. It would be equally rational to expect the medical profession to take up an attitude of opposition to the wearing of clothes, because certain garments had been known to induce a skin eruption, or, as the medical officer of the Local Government Board lately argued, to protest against the use of bed-clothes because babies were occasionally smothered in bed. The childishness of the proposal carries with it its own condemnation. Medical men see, in the occasional very rare accidents attending vaccination, reasons for endeavoring to make the method of operation as perfect as possible, not for abolishing a means of protection which annually saves countless persons from death by one of the most terrible disorders which has ever afflicted mankind. We do not, therefore, anticipate that the proposal will meet with a favorable response, nor do we suppose that such is expected.—*British Medical Journal.*

AMERICAN FOOD ADULTERATIONS.

THE chemists of the Department of Agriculture for a year or more have been investigating food adulteration in this country, and a report is in process of preparation. That portion relating to spices and condiments prepared by Clifford Richardson is completed. Mr. Richardson shows that no other kinds of human food are adulterated to such an extent. Of twenty samples of ground cloves examined only two were pure. The others had suffered the extraction of their essential oils and had been polluted by the addition of clove-stems, allspice and husks of various kinds. Of eight samples of cayenne pepper only one was pure. Of ten samples of mustard none were pure, unchanged mustard, though several had only suffered the loss of their fixed oil; the others contained quantities of wheat flour, the spurious matter being in some cases two thirds of the compound. This made it necessary to add turmeric acid (harmless) to restore the mustard color. Ten samples of allspice were examined, eight of which were pure. Four samples of cassia were all pure.

Of ten samples of ginger four were pure. Only one out of thirteen samples of black pepper was found to be what it purported to be. A specimen sent from Baltimore to a man who had an army contract was almost entirely spurious. Cayenne pepper, black pepper husks and mustard hulls were used to give flavor and pungency, while "body" was supplied by ground beans and rice and color by charcoal. Two samples of white pepper out of five were pure. Two samples of mace out of five were pure, and of three samples of nutmeg examined all were pure.

Mr. Richardson's experience leads to the conclusion that the public has the power in its own hands to effect a reform in the matter of spice adulteration. The quality of the article is usually fixed by the retailer, who names the price he is willing to pay. The grinder thereupon estimates the amount of pure spice he can afford to put in and fills out the order with refuse. Mr. Richardson incidentally mentions a New York

spice-grinder who, within a short time, worked off five thousand pounds of cocoanut husks. The ground article, which sells for less than the pure and unground, needs no test to prove it spurious. Usually when he demanded a pure article and called upon a first-class grocer for it he got it.

WELL-PRESERVED MEAT.—The river Viloui, in North Siberia, is frozen a greater part of the year. In the cold season the natives follow its course to the south, and as spring comes on they return. It was during one of these migrations that an entire rhinoceros was discovered. The river, swollen by the melting snow and ice, had overflowed its banks and undermined the frozen ground, until finally, with a crash, a huge mass of mingled earth and ice broke away and came thundering down. Some of the more daring natives ventured near, and were rewarded by a sight wonderful in the extreme. A broad section of icy earth had been exposed, and hanging from a layer of ice and gravel was a creature so weird that at first they would not approach it. It hung partly free, and had evidently been uncovered by the landslide. From the head extended a long horn, as tall as some of the children, while behind it was another, smaller one. But the strangest feature of this curious monster was that it was covered with hair.

At first the astonished discoverers thought the creature was alive, and that it had pushed aside the earth, and was coming out. But the great rhinoceros was dead, and had probably been entombed thousands of years. The body was frozen as hard as stone, and the hair-covered hide seemed like frozen leather, and did not hang in folds, as does the skin of living species. Several months passed before the animal was entirely uncovered, and so perfectly had nature preserved it, that it was then cut up and the flesh given to the dogs.—From "A Frozen Dragon," by Charles Frederick Holder, in *St. Nicholas* for April.

RAW COWS' MILK is very properly said to be better than boiled for young children, as it doubtless is also for adults. Boiled cows don't give good milk.

PICKLED PORK.

By Ed. P. Vollum, M.D., Surgeon U. S. Army, Medical Director Department of Texas.

(Extract from Official Report, Aug. 31, 1886.)

The records of this office (San Antonio) contain voluminous reports from all the post surgeons, who, without exception, denounce pickled pork as an article of food for the soldier in this hot climate. The men will not eat it unless driven to it by hunger; when it is served it is greasy, flabby and disgusting to the sight and taste. It makes some men sick to vomiting if they succeed in swallowing it. The small amount of fat needed in the diet in this climate is found in the most acceptable form in bacon, which the medical officers are unanimous in recommending in place of pickled pork.

It is a mistake to rate pickled pork as a valuable component of the ration in this region; it is very valuable on the Canadian frontier all the year round, but not here, for in that climate the system demands a large quantity of fat. The Canadian and Maine lumbermen seldom take anything at their noon meal but raw fat pork covered with molasses; the animal heat that is generated in his system, by the combustion of his fat diet, is necessary to keep him healthfully warm, but in these latitudes the atmosphere supplies, for most of the year, all the heat that is necessary for the system, and if a heat-generating diet is added to the external temperature, disease is sure to follow. The instinctive repugnance of the sight, smell, and taste to fat diet in hot climates is a warning that should not be disregarded, and it points as truly to what the system does not want, as the eager relish and appetite for fresh vegetables is an index of what the system does want in this latitude.

There is no doubt that some officers have preferred bacon to pork because it would sell for more, and thereby increase the company fund; but the medical officers, who have made so many earnest and forcible appeals for bacon, had no such

motives ; the question of health with them was paramount to expense, which, within reasonable bounds, has no place when health is considered. Their valuable reports on this subject will be printed as soon as arrangements can be made to do so, but I can say briefly here that the tenor of all of them is that pickled pork is not a necessary part of the ration in this climate ; on the contrary, it is not desired, and all the fat that the soldier needs in his diet can be obtained in the most palatable form in bacon.

FLAVORING EXTRACTS—ARE THEY POISONOUS?—Cooks, confectioners, and others engaged in the preparation of foods and drinks are in the habit of using various artificial perfumes, which in chemical language are such bodies as amylic valerianate, amylic butyrate, ethylic butyrate, propylic ether, and caprylic alcohol. The odor and flavor of the apple, the pear, the pineapple, the strawberry, and the raspberry can thus be imitated. These imitations not only remove the necessity for the use of the natural fruits, but are less expensive, and, besides having perfect similitude with them, give the appropriate flavor in a more accentuated form. MM. Poincaré and Vallois have sought to ascertain whether these artificially prepared perfumes possess poisonous properties by injecting them under the skin of animals, as well as introducing them into the stomach. Dogs and guinea-pigs can withstand even large doses of these substances when injected under the skin ; but these animals can be poisoned by sufficiently large doses, and then the symptoms set in rapidly. The most constant toxic symptom was great prostration, which was followed in a variable time by coma. These phenomena were less marked in the dog than the guinea-pig. All the animals were troubled with violent nasal irritation and sneezing, and distressed breathing was always evidenced by over-action of the respiratory muscles. An excessive secretion of mucus from the bronchial tubes was also noticed. Notwithstanding the gravity of the symptoms, the majority of the animals recovered. The practical outcome of these experiments is to sanction the use of infinitesimal doses such as are already employed for artificial flavoring of aliments.—*Zymotechnic Magazine.*

THE CARE OF THE INSANE IN THE STATE OF NEW YORK, HISTORICALLY CONSIDERED.*

By Stephen Smith, M.D., State Commissioner in Lunacy.

We have been invited to attend the graduating exercises of the first class of the Training School for Attendants connected with the Buffalo State Asylum for the Insane. The occasion is one of no ordinary interest and importance. It is the first event of the kind in the history of the public care of the insane.† It begins a new era in the progress of the great reforms which have characterized this century in the improvement of the methods of ministering to the wants and necessities of this unfortunate class.

The full significance of these exercises cannot be appreciated without understanding the past history of the management of the insane in this State. During the century of the existence of the State now about to close, we may find every phase of care of this class of dependent poor, from the most barbarous to the most intelligent and benevolent. We need not go beyond the limits of our own commonwealth to find illustrations of the care of the insane in every period of the world's history. They have been treated as demoniacs; have been classed with the lowest grade of criminals; have been regarded as paupers, requiring the custody of the almshouse; and, finally, they have been taken in their true character as sick people, requiring hospital care and attendance. Costly structures have been erected for their special purposes and uses, and they have been treated with the utmost tenderness.

The first law placed upon the statute book of the State of New York relating to the treatment of the insane was enacted in 1788, now nearly a century ago. This law gives us a vivid impression of the condition of the insane at that period,

* An address delivered before the first Graduating Class of the Training School for Attendants at the State Asylum for the Insane, Buffalo, N. Y., April 20th, 1886.

† Since this address was delivered it has been reported that a class of trained attendants graduated from a school in Massachusetts, in March of this year.

and of the state of public opinion in regard to them. The Act was entitled "An Act for apprehending and punishing disorderly persons," and was as follows :

"*Whereas*, There are sometimes persons who, by lunacy or otherwise, are furiously mad, or are so far disordered in their senses that they may be dangerous to be permitted to go abroad ; therefore, be it enacted that it shall and may be lawful for any two or more justices of the peace to cause to be apprehended and kept safely locked up in some secure place, and, if such justices shall find it necessary, to be there chained, if the last place of legal settlement be in such city, or in any town within such county."

This short but expressive act is prefaced with the significant phrase, "We, the People of the State of New York, represented in Senate and Assembly, do enact as follows." It stands, therefore, as the embodiment of the highest and best sentiment of the people of this State regarding the insane at the commencement of its organized civil existence. It was the popular opinion that only those insane who were "furiously mad," or so far "disordered in their senses" as to be "dangerous to be permitted to go abroad," needed public care ; and these poor wretches were to be taken into custody, not to benefit them by the ministrations of benevolence and humanity, but to protect society from their acts of violence. The quality and the grade of care which they were to receive were well defined in the Act, viz., they were to be "kept safely locked up in some secure place," and if their custodians found it necessary, they were directed to have them chained there. That this law was rigidly enforced the current history of the times affords abundant evidence. The lunatic in public care was found in every jail, despised even by the criminals with whom he was associated, and in the vast majority of cases he was chained. A contemporary medical writer of New York, speaking of the methods of confining the insane, says :

"Everything that met the view of the exiled sufferer about to enter them was suited to convey the idea of confinement and restraint, and that he was to be immured in and subject to the hardships of a prison ; an impression of lasting and pernicious tendency. He was, indeed, there shut up from the world, separated from his friends, and covered from the light

of day ; and amid the aggravated horrors of a dungeon, the chains which riveted his ghastly figure to the ground bound also in everlasting night the distinguishing attribute of his being. In such a situation, without an effort to revive the suspended energies of his mind, with nothing to awaken him to a sense of his human nature, without a ray of consolation of affection or of sympathy to beam upon him, he remained a neglected, forgotten, and abandoned prisoner. Thus forlorn, the whole plan and system of his custody were of a nature to drive him to despair and to the hopeless, the awful condition of irremediable madness."

The public care of the insane in this State has been quite closely modelled on that of England, and to the latter country we must refer for many of the more important features of our laws on lunacy administration. This first Act of our State Legislature was exactly copied from the vagrant laws of England. It was the first Act of Parliament relating to the custody of the insane, and was passed in 1744, forty-four years before it was adopted in this State. The impulses toward reform were, however, earlier felt in the mother country, and were more active and persistent than in the colonies.

If we examine the current events in the history of lunacy reform in England we find that at the time this law was enacted, in 1744, there were the first faint indications of a popular recognition of the relations of the insane to the State. The condition of the insane was most deplorable. They were arrested without warrant and confined in private mad-houses, without the possibility of escape. Their treatment was of the most cruel and barbarous character. No supervision whatever was exercised over either public or private institutions. The famous Bethlehem, or Bedlam Asylum, as it was popularly called, was the great institution of the period, and the condition of its inmates was beginning to attract popular attention. DeFoe had already described in scathing language the private mad-houses and the methods of incarcerating the insane in them. The condition of the patients in Bedlam and in the mad-houses was from time to time made public, and excited much discussion. Hogarth sketched the appearance of the insane in their cells, lying in the straw ; while other artists figured the inmates undergoing various kinds of torture.

But in spite of the efforts of a few philanthropists, no further legislation was secured until 1774, when England took the first step in the direction which she has steadily pursued from that date, and which has placed her in the first rank of the civilized nations of the world in the care of the insane.

At the period of the enactment of the law of 1788, by the State of New York, there were neither public nor private asylums for the insane within her borders. There was, therefore, no agitation of the question of the care of the insane. The only insane recognized were those who were furiously mad and dangerous to be at large. The Legislature sought to protect society against this class, and found in the English Vagrant Act of 1744, nearly half a century earlier, the formula of law for effecting its object. There was nothing in the English Act of 1774 which was applicable to the condition of the insane in New York, for they were not in asylums nor madhouses, but were in private care or in the pauper establishment. Nothing seems to have occurred to change the status of the insane until the year 1791, when the New York Hospital was opened for patients, and the first cases admitted are supposed to have been insane. This seems to have been the first provision in this State for the insane outside of the jails and the almshouse. The treatment of the insane in this hospital was little better than in the poor-houses and jails. Writers of that period still speak of the cells and chains of the maniacs. The attendants were but little above the common order of poor-house keepers or jailers, and there was as yet but slight agitation of the question of the improvement of the condition of the insane. It was at this time that the famous York Retreat of England, under the management of the Society of Friends, began to attract attention. A new policy was adopted in this institution. The inmates were regarded as susceptible of control and good government by humane measures. The old system of restraint was abandoned, and moral influences substituted. The result surprised England. This asylum became a model of good order, freedom from excitement, and absence of the old and familiar forms of restraint. The value of good attendants was here recognized. Many patients entered the wards who had been chained for years in other asylums, but who were soon made tractable under the influence of kind,

intelligent, and humane attendants. A visitor to the Retreat states that "they sometimes have patients brought to them frantic and in irons, whom they at once release, and by mild arguments and gentle acts reduce almost immediately to obedience and orderly behavior." It is said by the historian that the experiment at York Retreat would have failed had not the superintendent succeeded in securing attendants who were kind and gentle and willing to perform their duties in a humane spirit.

The fame of this institution spread throughout England and into European States, and gradually its influence moulded the lunacy system of Great Britain. In time the reports of the Retreat began to penetrate this country and awaken a new sentiment in the minds of the more philanthropic. It was not, however, until 1806 that any improvement was made in the care of the insane, though it is doubtless true that there was more or less agitation of the subject during the interval.

That there was an increasing interest felt in the care of the insane in this State is seen in the resolution of the governors of the New York Hospital, in 1806, to erect a new building for the insane, owing to the defective accommodations of the old building for this class of inmates. They appealed to the Legislature for aid, and that body appropriated the necessary sum, with the following preamble to the Act, which is interesting, as it gives expression to a very advanced opinion of the needs of the insane :

"It has become necessary, on account of the increasing number of patients in the hospital in the city of New York, to enlarge the same, by erecting additions thereto, for the more convenient accommodation of the sick and disabled, and particularly to provide suitable apartments for the maniacs, adapted to the various forms and degrees of insanity."

This is the first public recognition in this State of the fact that there are various forms and degrees of insanity which require the classification of the insane in suitable apartments.

The new building was in due time erected, and was called the "Lunatic Asylum." This asylum continued in active operation from 1808 to 1821, when the present Bloomingdale Asylum took its place. There are many evidences of the value of the experience gained in this institution, and of the influ-

ence which its management exerted upon the public mind. It led to the first effort of the State to make special provision for the insane poor, hitherto confined to poor-houses. This Act was passed in 1809, as follows :

"That it shall and may be lawful for the overseers of the poor of any city or town, by and with the consent of the common council of such city, or of two justices of the peace of the county in which such town shall be, whenever any poor person legally settled in such city or town, and maintained at the public charge, who was or who shall become lunatic or insane, to contract with the governors of the New York Hospital in the city of New York, for the maintenance and care of such lunatic on such terms as they may deem meet, and to transport such lunatic to the said hospital."

For thirty-four years this asylum, which in 1821 was removed and became the Bloomingdale Asylum, was the only institution in the State having the character of a public custodial institution for the insane. It was always under the best management, and the basis of its success has ever rested on the efficiency of its officers and the high grade of its attendants.

For nearly a quarter of a century, viz., from 1808 to 1827, this State presented the singular anomaly of confining its insane in jails, poor-houses, and a small asylum of a very high order of management. In the jails they were still treated as criminals, and were generally chained, as directed by the law of 1788. In the poor-houses or almshouses the chronic insane congregated, and were subjected to every possible degree of cruelty and neglect. In the asylum of the New York Hospital they were treated in the most humane manner by the best class of officers and attendants. Of the excellent management of this asylum there is much contemporary evidence, but no better testimony can be given than is furnished by one of the early superintendents in his annual report. He says of the asylum :

"The order and internal economy and government of the New York Lunatic Asylum have justly placed it in the highest rank among the best institutions of our country ; and the most improved establishments of the kind in Europe do not afford a source of higher congratulation on the benefits they have afforded to the most afflicted of our race."

Referring to the past, he says :

" The period is not remote when a variety of circumstances conspired to render the very name of a mad-house a subject of terror and dismay. The prevailing opinion of the friends of its unhappy tenants was, that they were placed within its walls, not as in a situation, where they might by lenity and kind treatment be restored to the blessings of health and reason, but as in a place of safekeeping ; disabled from injuring themselves and others ; where, from the supposed nature of their disorder, they neither deserved nor would receive the compassion of their keepers, and where they would inevitably languish and die."

Of what an asylum should be he gives the following very enlightened opinion :

" Asylums for the insane ought no longer to be viewed as places of personal security merely, but the temporary abode of a class of fellow-beings having the strongest claims to our sympathy and regard ; furnished with the means of comfort, amusement, and employment adapted to the circumstances of their condition and the nature of their disease."

Referring to the Bloomingdale Asylum, then in process of erection, he suggested, " that while it is of much importance that it be so constructed as to convey no idea but that of comfort, it may also admit of a classification of the patients during the day, according to their sex, condition of life, and various states of derangement, in separate apartments of convenient dimensions." He also recommended a " distinct building for the most raving and noisy, who should be constantly under the inspection of a faithful, humane, and discreet attendant. A convalescent," he adds, " should at all times be separated from the more insane. . . . The furious maniac . . . ought at times to be released from his chain and his cell, to be led forth to the refreshing influence of an untainted air and the liberty of such exercise as may promote so free and equal circulation. . . . When released," it is advised that " he should not associate with the deranged. . . . It is only by thus extending the freedom of the violent that we can ascertain the changes their malady may have undergone. Neglect in performing so imperative a duty is a negative act of unpardonable cruelty, which there are strong

reasons to believe has often doomed to immeasurable suffering many a wretched inmate of a lunatic asylum." He advises that in the new asylum two large apartments be appropriated for the sick of the two sexes, each having an attendant by night as well as day.

He gives the following reasons for these views: "With such a provision, the sufferer, in whose mind the light of reason had been long extinguished, might, during that gleam of intellect which frequently attends the closing scene of life, be made to know that he is a human being, meriting and receiving the compassion and kind offices of his fellows." The labor and amusement question he discusses as follows: "I would recommend that in all their recreations, whether of labor or skill or amusement, they should be separated from each other, and classed, as far as circumstances will admit, with the sane, engaged in similar amusements and pursuits. It has been found that such employments and recreations as require the most bodily exertion have been the most beneficial."

On restraint he held the following opinions:

"The means of safekeeping by bars and bolts and cords and chains are abundant, and easily obtained; but it should be the supreme object of those who have assumed the supreme responsibility of governing the insane, to restore to their reason and to society the greatest possible number of these afflicted beings; and we have no hesitation in believing that this will be most certainly accomplished by strict attention to a moral regimen. The greatest improvements in the treatment of madness have been of this nature; and the most approved physical agents of modern times were familiar to our remotest ancestors. With such views, the recovery of the deranged is not to be forgotten in the mazes of abstract research nor in those wild speculations on the nature of the reasoning faculty, under the influence of which it is often difficult to determine where the greatest alienation exists, whether in the patient or in him who has the care of him."

Finally, it is interesting to notice his opinions of the qualifications of attendants upon the insane:

"Those appointed should be reasonable, humane, moral, and religious, possessing stability and dignity of character; mild and gentle in their temper and deportment, but resolute in

their purposes and of great self-command ; never attempting by ill-directed efforts of superior strength to subdue the unconscious violence of their charge ; of just and sagacious observation and endued with clear and unclouded minds ; so compassionate and of such intelligence as not only to take an interest in the unhappy lot of the objects of their trust, but to be able to assist them in the recovery of their reason. In their ordinary visits they should approach the insane with an air of gentleness and kindness, expressive of concern for their unhappy condition, a deportment which will not fail to augment their respect and confidence on occasions requiring a more stern and distant intercourse. They should watch, with discriminating and unwearied attention, those favorable moments of drawing them from their hallucinations, their fantasies and wanderings, which frequently occur in the intermissions of many cases, both of madness and melancholy. The blunders of the ignorant and unskilful in the treatment of bodily disease are generally of rapid effect, and may soon end in the death of their victim ; but in the management of the insane, they are of slow, deep, and lasting consequence."

These remarkably clear statements on the management and construction of asylums for the insane, and of the proper qualifications of attendants, were published seventy years ago. They show that there were in New York, at that early day, men who had the most thoroughly correct views of the care and treatment of the insane and of the proper qualification of attendants. It cannot be doubted that these opinions had a wide dissemination among the leading citizens, many of whom were governors of the hospital. It is certain that the tone of public feeling toward the insane was now undergoing a marked change, for in 1827 the Legislature took the important step of passing an Act that "No lunatic shall be confined in any prison, jail, or house of correction, or confined in the same room with any person charged with or convicted of any criminal offence." By this law the insane in this State were forever separated from the criminal classes. Thus one class of attendants on the insane, which had held sway for fifty years, were dismissed from the service.

But the reform did not end with this act of legislation. On the contrary, it assumed a more important phase. The more

advanced members of the medical profession took the position that not only are the insane not criminals, but that they are sick persons who require hospital care for the purpose of recovery. This opinion gained ground, and finally became so prevalent that, in 1836, the State Medical Society memorialized the Legislature on the subject, using the following language :

"The time has arrived when we are called upon to discharge the uncancelled obligations of religious, moral, and social duty to that portion of our fellow-citizens whose appeal to our sympathies, justice, and humanity is the strongest claim which can, under any circumstances, be made by any portion of our population."

The memorial concluded by urging the Legislature to make provision for the erection of a proper asylum, for the support and medical treatment of the insane, with a view to their restoration to health, reason, their friends, and the community. The Legislature passed an Act establishing the State Lunatic Asylum at Utica. This asylum was completed so far as to be organized in 1842. By this Act the policy of the State became fixed in favor of regarding insanity as a disease which required prompt medical care and treatment. This reform was a vast improvement upon the past care of the acute insane. Every effort known to science was to be put forth to restore the acute insane to health. The asylum was organized under the ablest physician of this country, and the highest grade of attendants was secured. The value of that institution to the State in rescuing the acute insane from chronic insanity cannot be estimated.

But important as was this new departure, it did not disturb the large population of chronic insane who were still under the care of the almshouse-keepers, nor did it in any respect improve their condition. Investigations by the State a quarter of a century after the opening of the Utica Asylum showed that the condition of the insane in the poor-houses was most deplorable. They were treated in the same barbarous and cruel manner as in the earliest periods. Men and women were found chained to the place where they had remained from youth to old age. Then began a new effort which culminated in the organization of one of the most valuable and important

State charities in the world, the Willard Asylum. This institution was especially designed to remove the insane from the poor-houses and prevent their accumulating in these county resorts. Although it did not effect completely that object, it did lead to a reform, even in the care of the insane in these primitive institutions. Public attention was now directed to them ; the State began a system of inspections, and with the publicity which was thus given to their condition, the needed changes progressed rapidly. Better attendants were accorded the insane, better food and clothing were supplied, better accommodations were secured, restraint diminished, or ceased altogether. To-day there is not a poor-house in the State in which the insane have not comfortable quarters, good food and clothing, little or no restraint.

Standing as we now do, on the threshold of the centennial of this State, and estimating the future of the insane by the light of past reforms and improvements, the coming century is full of promise and bright with hope and anticipation. Although the agitation for lunacy reform began in England, and was most intense in that country, yet the reforms which were from time to time effected in her lunacy laws and in the management of her asylums were practically adopted and applied in this State. The history of that agitation in this State, as well as in England, is the history of the social progress of the people. There is no more striking illustration of the refining and elevating influences which have gradually moulded the public conscience into forms which give expression to the higher sentiments of philanthropy than the remarkable changes which have occurred in the relations of the State to the insane during the century of the existence of this commonwealth. One hundred years ago no one was recognized as sufficiently insane to require care or custody who was not furiously mad and too dangerous to be at large ; to-day insanity is recognized as a disease, having a great variety of expressions, and demanding treatment in its several stages by competent medical men. One hundred years ago the insane were arrested as common criminals, were incarcerated in jails, were tried by juries, and were condemned to imprisonment with the same formality as the indicted and convicted felon ; to-day no person can be lawfully declared insane, and be removed

from his home, unless he is first examined by two physicians who have been approved by the court as competent examiners in lunacy; who must give the facts on which they base their opinions in a written certificate, verified under oath; nor can such person be held in custody on this certificate more than five days, unless it is approved and signed by a judge of a court of record within that period. One hundred years ago the insane, when duly convicted by a jury, were incarcerated in cells and dungeons with criminals, and if necessary were chained; to-day the State of New York has provided for the insane residences, erected on the choicest available sites, and endowed them with every known convenience and appliance for their recovery and personal comfort. One hundred years ago cruelties and outrages in the personal treatment of the insane were of public notoriety, but they elicited no remonstrance, nor did they create a ripple of agitation; to-day the faintest rumor of unkind treatment of the insane, or even of restraint by the mildest means, arouses popular indignation as does no other tale of wrong or cruelty.

From this review it is apparent that the office of attendant upon the insane has advanced in character and importance in proportion as our views of the nature of insanity have improved. While they were regarded as criminals the common jailer was the care-taker; when they were believed to be innocent but troublesome persons, they were placed in charge of the almshouse-keeper; when it was established that they were sick persons, hospitals were erected for their care and treatment, competent physicians appointed to cure their maladies, and the highest class of nurses selected to attend them. The grade of care has, therefore, been steadily advancing, until to-day a far better class of attendants are in charge of the insane than at any former period. The commencement of this reform, in the selection of attendants, undoubtedly dates from the opening of the Utica Asylum. This being a curative hospital, every condition favoring the highest grade of treatment was adopted. That the superintendents of that institution have always sought to maintain a thoroughly competent class of attendants appears evident from the rules and regulations governing the conduct of its officers. Every other State asylum has, in turn, adopted the same high standard, and many of the

large county asylums have followed the example of the parent institution. Thus the reform has spread until in every asylum in the State there is now a careful scrutiny of the qualifications of all applicants for the position of attendant. The following extract from the book of instruction of attendants of the State Lunatic Asylum may now be regarded as the prevailing sentiment in reference to the character and obligations of attendants in all of our asylums :

" This asylum has been erected at great expense by the State, that the insane may have a safe retreat, in the care of those who have learned the best mode of managing them, and where they may have every chance of recovery. The first impulses of insanity are often met at home and among friends by resistance and opposition. The apparent difference in the conduct and feelings of their friends excites collision, arouses the passions, and awakens the prejudices of the victims of delusion. They now feel that those whom they loved have turned against them—that their friends purposely thwart all their plans, oppose all their desires, and resist what they conceive to be their own best efforts to promote the happiness of both.

" For these reasons it becomes desirable that they should be removed to the care of strangers, whose efforts to make them comfortable they often acknowledge and appreciate more correctly. From strangers they will also submit to requirements without a murmur which would excite the greatest hostility to friends.

" In the various departments all have daily much to do with the inmates of the asylum, and some devote their whole time to their care. It becomes all seriously to consider *how* this duty shall be performed ; what discipline of feeling and what subjugation of temper there shall be that the ' LAW OF KINDNESS ' may be administered to its full extent and in its proper spirit.

" Every person employed in the asylum, in any capacity whatever, must perform the duties assigned *conscientiously* and to the entire satisfaction of the managers, of the superintendent, and of those in immediate authority.

" No individual is worthy of a place in such an institution who labors for wages only. DUTY, *a desire to improve the con-*

dition of all within the sphere of influence, to increase the happiness and lessen the sufferings of each and all the inmates, should be the governing motive of daily conduct. It must never be forgotten that we are dealing with fellow-creatures, who, being deprived of reason, are not responsible for their conduct. The regulating power of moral action is withheld from them ; hence they are capricious, passionate, and often violent. They often also misjudge and are led astray by perverted senses or by delusions of the understanding, which carry them far from the proprieties of rational conduct.

" It is because they are unable to control themselves, and because they do not readily acquiesce in the directions of their friends, that many of these individuals are placed in the asylum. Here they are to have every comfort and every reasonable indulgence which, individually or collectively, will promote their best good. Here they look for sympathy and counsel, for assistance in their various troubles and perplexities. We should enter into their feelings, and show our willingness to spend our time and strength to promote their happiness and recovery to health.

" To withhold what may reasonably be required is to do *them* injustice and disregard *duty*. To treat them with neglect or with unkind and hasty language, or in any way to tantalize them or to recriminate or to return violent or abusive words, is to do them injury.

" PERSUASION with a proper spirit will generally be followed by a quiet acquiescence in all reasonable requirements. *Much depends upon the* MANNER *of intercourse with the insane.* We should never be cold and insensible to their wants ; never hasty and impatient in our intercourse ; never turn a deaf ear to their representations ; never treat them with neglect nor with feelings of superiority ; but mingle with them in kindness, address them with respect, and we shall secure their confidence, which is necessary to their best care."

No stronger appeal could be made to the higher and better feelings, to impress a sense of moral obligations, than is embodied in this short admonition. It was the key-note to a reform which has elevated the status of attendants upon the insane to its present high position.

When I began my official inspection of the institutions for

the insane in this State, I entertained no very friendly opinion or sentiments toward their management. And especially did I regard the attendants as a class of men and women probably much below the average of the nurses in hospitals with which I was connected. I should be recreant to my sense of justice did I not, in this place and in this presence, bear willing and emphatic testimony to the generally good character of attendants in the State and metropolitan asylums. They form a corps of workers numbering about 1000, who in intelligence, moral character, and devotion to duty are worthy of the confidence of the community. I have seen them in every capacity, and have tested them by every suitable method, night and day, and I know of no class of employés who could have better sustained the scrutiny. It is true that there are individual exceptions, as must necessarily be the case in every profession or occupation; but as a body of men and women, engaged in a special calling, they are the peers of the best grade of hospital nurses and attendants.

As an example of the thoroughness with which attendants now perform their duties, I would state that during one year I examined the clothes, the person, and the bed of every so-called filthy patient in the asylums of this State, and found but one bed not wholly clean and in good condition.

My originally unfavorable opinion of attendants grew out of my unfamiliarity with the peculiarly responsible and difficult duties which they have to perform. And I think the public criticism of attendants would be greatly modified and mitigated if the nature of these duties were better understood. If we but consider the first and primary rule in asylum management, we can readily understand how a conscientious and careful attendant may have all his acts misconstrued, especially by patients. The first and highest duty of the attendant is to maintain good order and discipline. Good order is not more necessary to the comfort of the patients than to their recovery. Discipline in the orderly attendance to duties is the first lesson to impress upon the insane. And yet, in the very nature of insanity, we find the most violent antagonism to both order and discipline. The early popular definition of insanity in this State, as we have seen, was "disordered in his senses." The first recognizable insane act is usually that of disorder.

Then follows a disposition to wander and great intolerance of restraints of any and all kinds, and from every source. Friends now fail to exert any influence over them, or if they attempt to do so, the insane violently resist, and conceive the most intense hatred of their best and nearest relatives. No one but an attendant can fully realize the difficulty of controlling the morbid impulses of such a patient when first introduced upon a ward. He has thus far gratified every wish or purpose, and thereby his will to do as he pleases has gained strength and determination. Every effort is employed to induce him to comply with the rules of the asylum, such as to go to the table when the bell rings ; to go to bed and rise at a given hour ; to make his own bed ; to wash before meals. All these rules he refuses to comply with, resorting to the most violent demonstrations toward those who attempt to compel him to obey. How shall such a man be brought to obedience—perhaps the very first step toward recovery ? Reasoning does not influence him ; to allow him to disobey only intensifies his obstinacy. The only alternative now recognized is manual force. He is overcome by superior strength, and the first link in the chain of disorderly thoughts and feelings is broken. The attendants have done their duty, according to the manual. They have done their duty well and faithfully, according to the rules and regulations of asylums, and have not abused their trusts. But patients in their insane state very naturally construe these efforts as gross forms of abuse. I have many a time seen attendants lift paralytics from their filthy beds, and carry them to the bath-tub as gently as their struggles would permit, while these patients would call on me to witness the cruelties to which they were subjected. The same scene is often repeated when attempts are made to induce patients to eat, to walk out, to make their beds.

It may, I think, be stated that, in the nature of the case, no institution where the insane are held in custody has ever been, nor perhaps ever will be, popular with the insane. There are many who will leave it restored to their right minds, profoundly grateful for the care and attention which they have received ; but there is another larger number who will leave it unimproved, and who will never fail to entertain the most hostile feelings toward all engaged in its management. There

are asylums in this State where all the ministrations are inspired by the purest and most self-sacrificing religious sentiment. In these institutions the superintendent, attendants, and subordinates are all selected with reference to their special fitness for their duties. The immediate attendants upon the patients are women of culture and refinement and life-long devotion to unrequited charity. And yet, in these asylums, I have listened to tales of cruelty, neglect, and improper treatment of the most aggravating description. But many a recovering patient has informed me that the first step in his restoration was the act of being brought to orderly habits in the daily routine of ward life.

I do not wish to be understood as asserting or implying that attendants never abuse patients. Unfortunately that is too true, as the dismissals from asylum service prove. Nor do I wish to be understood as in any sense apologizing for cruelties to the insane. On the contrary, all such offences, when proven, should be punishable as assaults upon the person ; I would only ask that common justice be meted out to those who perform their duties—often most disagreeable—conscientiously and in accordance with rules which they have promised faithfully to obey. If we consider that in the arrangements of asylums an attendant must always be on the ward, and always on call ; that many of their duties are of the most menial character ; that they are constantly subjected to indignities and often assaults ; that they are largely debarred from social privileges, we gain but a faint impression of the daily life of an attendant. In one of my reports I attempted to give the daily routine of duties of attendants, from their rising to their retiring. A gentleman of high standing, who had hitherto been prejudiced against attendants, expressed his astonishment, after its perusal, that men and women could be found who would perform such duties at any price, and especially at the prices now paid. It is gratifying to know that this asylum is about to grade the wages of attendants, and thus to have a much more equitable system of payments. It is by this means that the best service can be secured.

Great as has been the improvement in the character of attendants—and it has been remarkable—there has always been apparent an absence of that special training which is essential

to the full development of the qualifications for their special duties. Aptitude for any department of work is necessary to success, but without special training aptitude avails little in fields where skilled labor is required. In the care of the sick aptitude for nursing has hitherto been regarded as the only qualification. But within ten years to aptitude has been added training by a systematic course of instruction, and the result is that the old grade of nurses have been completely driven from the field. And if the nurse of one sick of a physical disease is so much improved by training, how infinitely more important is it that those who are to minister to a mind diseased should have special training. The power which an apt and trained attendant exerts over the insane is oftentimes marvellous. In many instances I have seen skilled attendants remove the restraint from violent patients who had resisted every known measure of securing good behavior, and from the first perfectly control them. I cannot, therefore, too much commend this first effort to thoroughly prepare attendants for their duties. In fact, I have no doubt that within a decade no attendants will be employed in the State asylums of this State who have not their certificates of graduation from a Training School. When that period arrives we shall doubtless witness improvements in the management of the insane which will relieve asylums of that suspicion and prejudice, on the part of the public, now so prevalent.

We may, I think, divide the care of the insane in this State, during the century, into three periods. The first period was that of *mechanical force*, when the jailer-attendants enforced obedience by chain and scourge. But the jailer-attendant with chain and scourge has long since passed into merited oblivion. The second period was that of *manual force*. We are passing through that phase of evolution now, and it has until recently seemed the very highest degree of development attainable. The amiable and able Dr. Connolly, a powerful advocate of the abolition of mechanical restraint in England, has strongly advocated manual force. The struggles of an obstinate patient with his attendants, and their final mastery over him, was regarded by this great alienist as in the highest sense curative. But there are striking evidences that a new era is at hand—the third of the series. This period

will be that of *mental force*, or the power which a trained and skilled attendant will exercise over the disordered senses, whether by soft words and gentle persuasion or by the imperious tones of a master. In the organization of this school, and in the graduation of this class, we witness not only the dawn of that new period, but the fulfilment of its promise.

For the graduating class I have only words of praise and encouragement. From the preceding review it is apparent that your occupation has gradually developed from humble beginnings to the rank of an honorable and useful profession. You are no longer called upon to act the part of a custodian of a criminal, but to be the skilful, intelligent, gentle guide of an erring mind. Instead of restraining the wandering feet with chains and the violent hands with manacles, your office will be to direct those feet to paths of order and discipline and those hands to useful labor. Your greatest measure of success will not be won by physical prowess, but by the triumph of a sound, healthy, and well-ordered mind over the shattered forces of a mind diseased. You are the pioneers in this great reform, and on your conduct and character its success will largely depend. Your position and your future progress will be closely scrutinized, both by friends and foes. If success crown your efforts, your reward will be great. You will stand as the representatives of one of the most beneficent reforms in the history of the care of the insane.

Mr. President, the inauguration of this Training School for Attendants will, I believe, more signally and effectually establish the reputation, in the distant future, of the Buffalo State Asylum for the Insane than any other act or event in its history. Already we hear from many asylums the notes of preparation to follow your example. To be the pioneer of a far-reaching reform, not only in the original conception of its underlying principles, but in the organization and perfection of the system or scheme by which its benefits are to be secured, is the highest honor to which man can attain. It is, then, with no ordinary pleasure, and with a profound sense of duty, that in this public capacity, and on this auspicious occasion, I acknowledge the obligations of the State, of every citizen interested in the best care and treatment of the insane, and of the insane themselves, to the founders and promoters of this school.—*American Journal of Insanity.*

THE NEW YORK TENEMENT HOUSE LAW.

THE new Tenement House law recently enacted by the Legislature of New York provides for the detail of fifteen policemen to enforce the Sanitary Code so far as it relates to tenement and lodging houses. The Board of Health is to report every year. The Mayor and one Commissioner from the Department of Health, the Commissioner of Public Works, one delegate from the Bureau of Inspection of Buildings, and the Street Cleaning Commissioner shall meet annually between November 15th and December 30th to consider the subject of tenement and lodging houses in New York, and shall make such recommendations of improvement in the laws affecting tenement and lodging houses as will best serve the interests of the people. These recommendations shall be sent to the Governor and the Legislature by January 15th. Provisions are made that where more than one family reside on a floor the halls must open directly to the external air with suitable windows, without obstruction, to insure proper ventilation. Every tenement and lodging house must be provided with improved privy sinks or such receptacles as the Board of Health may require, one for every fifteen occupants in lodging-houses, and not less than one for every two families in dwelling-houses, with proper traps, sufficiently ventilated to prevent the escape of poisonous gases. Every tenement-house shall be connected with the sewer by air-tight pipes, as required by the Board of Health, and shall be properly cleansed and flushed.

Every owner of a tenement or lodging house is compelled to file with the Department of Health a notice containing his name and address, a description of the property by street numbers or otherwise, the number of apartments, and the rooms in each apartment, the number of families occupying each apartment, and the trades or occupations carried on therein. Notices and orders from the Board of Health shall be filed in a conspicuous place in the building five days before doing the thing for which the notice is issued. On the same day a copy of the notice is to be mailed to the address of the owner.

The Board of Health is empowered to close a building which is deemed unhealthful and its orders are not complied with, whether the owner be present to protest or not. Twice a year the Board of Health shall inspect all tenement and lodging houses. Stringent provisions are made against the occupation of an entire city lot for a tenement. Any court of record is authorized to restrain by injunction an owner of a tenement who refuses to comply with the requirements of the Board of Health. Water is to be supplied in sufficient quantity at one or more places on each floor. Cellars shall be water-tight, and when the house is built on made ground the cellar floor shall be covered to prevent evaporation or dampness.

EDITOR'S TABLE.

DR. STERNBERG'S LETTER.

THE appendix marked "(C)" to the Report of the Committee on the Disinfection of Rags, on preceding pages, is remarkable for both the manner of its appearing and its substance. By vote of the American Public Health Association, at the Toronto meeting, that report was ordered to be published in extra issue from the volume of proceedings with a view to its more extensive circulation. Proof-sheets were sent to each member of the committee for correction and signature, to be returned to the Secretary of the Association through the chairman of the committee. Dr. Raymond's copy was returned after considerable delay, accompanied by the letter referred to from Dr. Sternberg, with whom he joined in a request to have the letter published in connection with the report, in the proposed pamphlet issue. Besides objectionable features in the substance of Dr. Sternberg's letter, the chairman of the committee considered the proposition unjustifiable by the constitution of the Association, that any member should be given the extraordinary privilege of adding to the report of a committee, of which he was not a member, or of having published in connection therewith remarks formulated after the adjournment of the meeting. To have conceded such a privilege would have carried with the concession the right of the committee, or the chairman thereof to respond to Dr. Sternberg's

exceptions. But, out of deference to Dr. Sternberg, as President-elect of the Association, and the use the committee had made of his published observations and experiments on the subject, while the chairman of the committee disapproved of the request to have the letter published in connection with the pamphlet edition of the report, he suggested, and so wrote to the Secretary of the Association, that, if the letter was admissible in the proceedings of the meeting at all (of which it was not a part), its proper place was under the discussion which followed the reading of the report. Notwithstanding, it seems after the proof-sheets had all been returned, and the members of the committee no longer had copy before them for observing the inconsistency of Dr. Sternberg's letter, the Secretary took it upon himself, without informing the chairman of the committee, and so giving him opportunity to correspond with his associates and state his objections, to canvass the sense of the committee, severally, on the proposition. One member, Dr. H. B. Baker, Secretary of the State Board of Health of Michigan, the chairman is informed, wrote very decidedly to the Secretary against it. Dr. Chancellor, being abroad, was, presumably, not consulted. The other four members of the seven (of the committee), "asked that it be published with the report presented at the Toronto meeting," and the rest as stated in the Secretary's introduction of the letter.

The whole proceeding is, in the judgment of the chairman of the committee, unprecedented, unconstitutional, and inconsistent with the practical work of the Association hitherto. But besides this unauthorized work of the President, Secretary and Executive Committee, the substance of Dr. Sternberg's letter in this connection is inconsistent and harmful. For, while he regards the report as "extremely valuable, for the reason that it contains the available positive evidence relating to the transmission of infectious diseases by old rags," reiterates his continued belief in their danger, so emphatically expressed in his letter to the surgeon-general of the army, in March 1885 (quoted in the report), again expresses his faith in the practicability of disinfecting them, based upon his own experiments, and after condemning in the strongest language the processes of the so-called "disinfection" abroad—after all this—he appears to accept propositions singularly coincident

with the newspaper reports of the fallacies expressed by some of those who took part in the discussion of the report at the meeting in Toronto, that, for example, the disinfection of rags by steam at a temperature of 230° to 250° (according to the opinion of the rag merchants in Europe) injured the rags, which he knew by his own experiments was not true; and, "taking all the circumstances into consideration, he thinks it will be prudent for us in future to adopt the policy of England and of the leading nations of the Continent of Europe, and to exclude rags from cholera-infected countries, rather than to trust to their disinfection either before shipment or at the port of arrival," while he very well knows that the country or port of exportation is no indication of the place where the rags have been collected, and that while England, at least, if not other foreign countries, prohibits the landing of rags at her own ports, she facilitates their transportation to the United States by giving them a new clearance from a healthy port.

The evidence adduced by the committee that small-pox is frequently transmitted by rags, he deems conclusive; but with regard to it, he also recommends measures equally impracticable. He would rely upon the thorough "protection of all employés of paper-mills and the general public from this disease" by vaccination; but he fails to tell us how he would secure it, or to recognize the fact that no port health-officer has any authority in such premises, and that both local and State health authorities throughout the country have signally failed in their efforts to secure it. With regard to the transmission of other infectious diseases besides cholera and small-pox, he thinks "the danger from baled rags *in transit* is hardly worthy of consideration," and says nothing about the danger of handling them *after* transit, in the cleansing. "But if a bale as a package of merchandise is considered dangerous, it could easily be disinfected externally by placing it in a proper receptacle, and subjecting it to the action of steam at a temperature of 230°–250°. Such external disinfection of bales should be practised when there is any reason to suppose that they may have become infected *in transit*, by passing through seaport cities, or by being transported on ships, infected with cholera, yellow-fever, small pox, or any other infectious disease. This would not be expensive, and certainly would not materially injure the rags." . . . It seems probable that some

such process as this was practised on the rags which recently introduced small-pox in the Holyoke paper-mills—particularly noticed in our March number.

"Finally," he says, "I would *require* all rags shipped from a healthy port during the prevalence of cholera in Europe to be disinfected by steam before they were baled for shipment." Which he has no means of requiring. In short, Dr. Sternberg recommends impracticable measures, and straddles the question at issue. The effect of his letter will be to continue the contention between the health authorities and the rag importers. He appears to recognize the fact that it is not the means of disinfection which he recommends as the most efficient, but to any quarantine restrictions whatever to which rag-handlers object; and, therefore, he states that "in the absence of any prevailing epidemic I would not treat baled rags differently from other merchandise." But immediately adds: "If, for any reason, the health officer at the port of arrival considers such merchandise dangerous, it is evidently his duty to disinfect it. This can be done most effectually by steam." That he would not treat baled rags differently from other merchandise is equivalent to saying that foul merchandise should be placed upon the same plane as that which is clean; and, that, logically, foul ships, unless disease is actually present, require no more attention by health officers than clean ones; propositions wholly inconsistent with accepted practical knowledge of the danger of disseminating infectious diseases by commerce.

His conclusions, to be consistent with practical knowledge, protective of the public health and promotive of commerce, should be so modified as to read: Unless the health officer at the port of arrival considers merchandise absolutely devoid of danger of spreading *any* infectious disease, it is evidently his duty to render it so no matter what it consists of.—The protection of the public health is the paramount question, and should not be lost sight of under any circumstances.

THE NEW YORK ASSOCIATION FOR IMPROVING THE CONDITION OF THE POOR.

We have for many years indulged the belief that progress in measures for the protection of human life greatly consists in exposing the consequences of their neglect. But when we

consider that for forty-three years, continuously, "The New York Association for Improving the Condition of the Poor" has been assiduously engaged in making such exposures, that twenty-one years ago the Citizens' Association of New York joined hands with this Association, and by the publication of a volume of 400 pages graphically describing the conditions which at that time obtained, that the city of New York has had a Health Department, at least, ever since February 26th, 1866, with abundant power for improving the conditions exposed, and that for the year 1886—and all the years between—the Association for Improving the Condition of the Poor rehearses variations only of the same conditions, our faith is shaken not only in a favorite sentiment, but in public sensibility.

"At the time the Council of the Citizens' Association completed its sanitary survey of the city, December, 1864, there were 495,592 persons in this city residing in tenant houses and cellars; the total number of tenant houses was 15,309, and the average number of families to each of these houses was $7\frac{1}{6}$, including the poor families that take boarders, keep lodgers, etc. . . . Including a proper *pro rata* of the entire area of the public streets, the total superficial area allotted to these 15,309 houses, the 111,000 families and the 480,368 persons that dwell in them, is about *two square miles.* That is, the tenant-house population is actually packed upon the house-lots and streets at the rate of 240,000 to the square mile. . . . As now (in 1864) distributed, the tenant houses of the city are nearly all found within an area of iess than four square miles."* In the same report are given illustrations of "A Perpetual Fever-nest," "Cotham Court," "A Tenant-House Cul-de-sac," etc.; and one of the sanitary inspectors of the Association reports that the death-rate in his district was *one in twenty-four* (46 per 1000) of the population. The report before us contains similar illustrations on recent inspection, except cellar tenements, and the Health Department reports show about the same proportion of deaths from preventable diseases. Yet, section 14 of the law creating the Metropolitan Board of Health (devolved upon the succeeding organization) provides that, "Whenever any building, erection, excavation, premises, business pursuit, matter or thing, or the sewerage, drainage

* Report of Council of Hygiene, Citizens' Association, p. 69.

or ventilation thereof, in said district, shall, in the opinion of said board (whether as a whole or in any particular), be in a condition or in effect dangerous to life or health, said board may take and file among its records what it shall regard as sufficient proof to authorize its declaration that the same, to the extent it may specify, is a public nuisance, or dangerous to life or health ; and said board may thereupon enter into its records the same as a nuisance, and order the same to be removed, abated, suspended, altered, or otherwise improved or purified, as said order shall specify." But this law, not having been found by the Board of Health to be sufficiently explicit and authoritative, has been several times amended, ostensibly for more power, but really in excuse for neglect of duty. Again, we record on another page an amended tenement-house law. It lacks one important feature for which we have long contended, namely, requiring the Board of Health to designate a certain number, say, ten, of the worst of the tenement houses known to be unfit for habitation, for assessment and removal annually. This would, *if made mandatory*, and without the power of excuse by the Board of Health, greatly accelerate the needed reform.

In the place of such removals in the densely populated districts, trees should be planted and the ground turfed over. The requisite assessments necessary for such a procedure would be less than the average annual costs incurred by the city and the Association for Improving the Condition of the Poor, in the care of the sick and the burial of the dead from the diseases which it would prevent. Of these requisites the writer had occasion to express himself more in detail through a committee of the State Board of Charities ten years ago (see Ninth Annual Report of the State Board of Charities, 1876), citing as example what had been done in Glasgow under similar circumstances.

But under the auspices of a reorganization of the Health Department—assuming that appointments hereafter to be made will be based upon the same standard of fitness as that of the recently appointed President—and the continued co-operative work of the Association for Improving the Condition of the Poor, New York certainly has more now to base hopes for improvement upon than it has ever had before. And it is

not too much to say that the steady work of the Association for Improving the Condition of the Poor from its beginning in 1843 to the present time has done more both for the care of the sufferers in consequence of the neglect of officials and for the promotion of the present encouraging auspices than all other influences combined. We earnestly commend it to the generous support of the public. The objects of the Association, briefly expressed, are : to promote whatever tends to the *permanent* improvement of the condition of the poor. It endeavors to reduce vagrancy and pauperism, and to ascertain their true cause ; to prevent indiscriminate and duplicate almsgiving ; to secure the community from imposture ; to see that all deserving cases of destitution are promptly relieved ; to make employment the basis of relief ; to elevate the home-life, health and habits of the poor ; to introduce and encourage habits of thrift, saving and economy ; to aid in carrying out the laws relating to the health and cleanliness of the city, and to secure for the tenement-house population improved conditions of living.

Its office is 79 Fourth Avenue, where all needful information in regard to its work may be obtained.

MORTALITY AND MORBILITY STATISTICS AT MOST RECENT DATES.

CALIFORNIA.—The mortality for the month of February reported by the Secretary of the State Board of Health, from an estimated population of 585,610, was 866—a decrease of 59 from that of the preceding month. Consumption, 160—7 more ; pneumonia, 71—7 less ; bronchitis, 27—5 less ; congestion of the lungs, 11—1 less ; diphtheria and croup, 51—13 less ; typhoid-fever, 21—the same. Small-pox has appeared in Los Angeles and South Pasadena, 3 deaths reported from the former, and 3 cases and 1 death from the latter during the month.

San Francisco, with an estimated population of 280,000, 451 deaths. From consumption, 75 ; acute lung diseases, 41 ; diphtheria and croup, 30 ; typhoid-fever, 9. Death-rate, 19.9.

CONNECTICUT.—Summarized from the report of the Secretary of the State Board of Health for the month of February, the mortality and chief causes of death in nine cities were as follows :

Bridgeport, 49; zymotic diseases, 5; phthisis, 14; pneumonia, 6.

Hartford, 76; zymotic diseases, 9; phthisis, 13; pneumonia, 5; nervous diseases, 8; heart disease, 8.

Meriden, 17; zymotic diseases, 4; phthisis, 2; nervous diseases, 3.

Middletown, 21; zymotic diseases, 4; phthisis, 3; pneumonia, 2; nervous diseases, 1; heart disease, 1.

New Britain, 18; zymotic diseases, 1; phthisis, 1; pneumonia, 1.

New Haven, 116; zymotic diseases, 6; phthisis, 21; pneumonia, 15; nervous diseases, 18; heart disease, 11.

New London, 19; zymotic diseases, 4; phthisis, 2; pneumonia, 1.

Norwalk, 19; phthisis, 4; pneumonia, 2; nervous diseases, 2; heart disease, 2.

Norwich, 44; zymotic diseases, 7; phthisis, 8; pneumonia, 3; nervous diseases, 4; heart disease, 4.

Waterbury, 36; zymotic diseases, 6; phthisis, 7; pneumonia, 4; nervous diseases, 3; heart disease, 3.

Total, 415—109 were of children under 5 years.

In public institutions—there were 12 deaths in New Haven, 22 in Hartford, and 7 in Middletown. Deducting these from the full number reported gives the following as the annual death-rates for the cities: New Haven, 15.6; Hartford, 13.8; Bridgeport, 14.7; Waterbury, 14.4; Norwich, 22.5; Meriden, 9.3; New Britain, 11.7; Norwalk, 15.2; Middletown, 14; New London, 19. The annual death-rate in these nine cities was 16.7 per 1000 of the population. Of the deaths from zymotic diseases, one was from small-pox, at the almshouse in Waterbury. Three cases have occurred there since. At the date of the report the origin of the disease had not been traced.

DELAWARE.—*Wilmington* reports 68 deaths during the month of February, in a population of 57,000, of which 17 were under 5 years of age. Death-rate per 1000, 14.32. From zymotic diseases there were 6 deaths; from consumption, 16.

DISTRICT OF COLUMBIA.—The Health Officer reports for six months ending December 31st, 1886: Estimated popula-

tion, white, 140,000 ; colored, 70 : 210,000. Deaths, white, 1282 ; colored, 1025.

From zymotic diseases,	white,	227 ;	colored,	283 : 610.
Constitutional diseases,	"	302 ;	"	286 : 588.
Local diseases,	"	478 ;	"	394 : 872.
Developmental diseases,	"	133 ;	"	122 : 255.
Violence,	"	52 ;	"	40 : 92.

Of the deaths from zymotic diseases, there were from diarrhœal diseases, 230 ; typhoid-fever, 90 ; malarial and typho-malarial-fevers, 91 ; diphtheria and croup, 63 ; inanition, 67. Of the constitutional, from consumption, 369—15.3 per cent of the whole number from all causes ; 945 were of children under 5 years of age. Death-rates, for the white, 18.46 ; colored, 32.14 : 23.02.

Marriages reported, 544—409 between white parties, 145 between colored parties, and there was one mixed marriage.

Births reported, 595 white males, 550 white females ; 404 colored males, and 418 colored females ; total, 1969.

GEORGIA.—*Savannah :* Consolidated mortuary record of this city from 1854 to 1886, inclusive, shows conclusively that, prior to the freedom of the negroes, their death ratio in Savannah was much smaller than that of the whites ; while since it has risen to more than double that of the whites. For the ten years, 1854 to 1863, including three yellow-fever epidemics, when the ratio of deaths of the whites was greatly in excess of the colored, the death-rates were : whites, 42.6 ; colored, 29.6. During the last eight years, 1879 to 1886, since there has been no yellow-fever in Savannah, the death-rates have been : whites, 20.2 ; colored, 43.3. In 1886, the rates were, respectively, 17.1 and 49.8. For the month of January, 1887 : 36 deaths in 26,675 white population, and 59 deaths in 19,111 colored population, making the respective death-rates 16.1 and 37.0 per 1000, and 26.5 for the whole population of 45,786. The deaths from zymotic diseases numbered 21, and from consumption, 11.

ILLINOIS.—*Chicago* reports 1170 deaths during the month of February in a population of 704,000, of which 578 were under 5 years of age. Death-rate per 1000, 19.94. From zymotic diseases there were 233 deaths, and from consumption, 114.

Rock Island reports for four weeks ending February 26th, 20 deaths in a population estimated at 13,655, of which 6 were under 5 years of age. Death-rate per 1000, 19.0. From zymotic diseases there were 5 deaths, and from consumption, 3.

LOUISIANA.—*New Orleans* reports for February 266 deaths in 176,500 white population, and 155 deaths in 66,250 colored population, making the respective death-rates 18.08 and 28.07 per 1000, and 20.81 for the whole population of 242,750. The deaths from zymotic diseases numbered 481, and from consumption, 63. There were 142 deaths under 5 years of age.

MARYLAND.—*Baltimore* reports for four weeks ending February 26th, 599 deaths in a population estimated at 417,220, of which 207 were under 5 years of age. Death-rate per 1000, 18.67. From zymotic diseases there were 62 deaths, and from consumption, 90.

MASSACHUSETTS.—*Lowell* reports 171 deaths during the month of January in a population of 68,000, of which 64 were under 5 years of age. Death-rate per 1000, 25.14. From zymotic diseases there were 47 deaths, and from consumption, 16.

Waltham reports for a period of 17 years, 1870 to 1886, inclusive, for the first nine an average death-rate of 26.2 ; and for the last eight, 15.11. Meanwhile the population has increased from 9065 to 14,609. Practical sanitation tells its own story.

MICHIGAN.—At the annual meeting of the Board at Lansing, January 11th, the Hon. John Avery, M.D., gave his annual address, in which he scanned the work of the past year, with special reference to the sanitary improvements which had been effected on the advice of the Board in the prisons and other State institutions, and the increased attention manifest generally with regard to drainage, heating, lighting, ventilation, etc., of public halls, school-houses, churches, and private buildings. The Board had been greatly aided in the progress of its work by the sanitary conventions, of which there were sixteen during the year, generally well attended, with the re-

sult of bringing the local health officers and the State Board into closer relations with each other, and of creating a more general interest in all matters pertaining to the public health.

Dr. Henry F. Lyster, chairman of the committee appointed to confer with the Regents of the University relative to the establishment of a laboratory of hygiene at that institution, made a report urging its importance. Dr. Vaughan also spoke on the same subject, more in detail, proposing a plan of study and a schedule of subjects. The report was indorsed by the secretary, Dr. H. B. Baker, who, in the course of the discussion, remarked :

"The highest education, and that of most utility, is that which best fits one for right living, in every sense—that which has to do with the preservation of life and the perfection of physical and mental health. To supply this higher education, in recent times, the several sciences have been laid under contribution to form a science of hygiene, usually called sanitary science. So long as the State University fails to supply this higher education, which is of most utility and vital importance to the people of this State, or continues to give it a place inferior to the ordinary sciences, the University cannot expect more than half-hearted support by those who have at heart the highest interests of the people."

The following resolution was adopted :

Resolved, That we earnestly memorialize your honorable bodies to take such action as shall lead to the maintenance of a well-equipped laboratory of hygiene at the University of Michigan, and of such instruction in sanitary science at that institution as shall place that subject on a plane not inferior to that of any other subject taught at the University.

The secretary submitted exhibits of the number of deaths, and a comparison of the proportions of deaths from scarlet-fever and small-pox during the last five years previous to the establishment of the State Board of Health, 1869–73, and the eleven years, 1874–84, subsequent to its establishment, showing that, allowance being made for the increase of population, the saving of lives from scarlet-fever has been 338 annually, or 3718 lives from this one disease during the first eleven years after the State Board of Health was established. And from small-pox 98 lives annually, or 1073 lives during the same

period. Thus, from the two diseases, scarlet-fever and small-pox, there is indicated by the statistics in the office of the Secretary of State to have been a saving of nearly 5000 (4791) lives in Michigan during the eleven years following the establishment of the State Board of Health.

Report for the month of February, 1887, compared with the preceding month, remittent-fever decreased in prevalence. Compared with the average for the same month in the nine years, 1879–87, intermittent-fever, remittent-fever, pneumonia, diphtheria, consumption of lungs, and influenza were less prevalent in February, 1887. Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of February, 1887, at 34 places, scarlatina at 42 places, typhoid-fever at 16 places, and measles at 24 places. Reports from all sources show diphtheria reported at 22 places less, scarlet-fever at 6 places more, typhoid-fever at 2 places more, and measles at 3 places more in February than in the preceding month, January, 1887.

Compared with the preceding month the temperature in the month of February, 1887, was higher, the absolute humidity, the relative humidity, the day ozone, and the night ozone were more. Compared with the average of corresponding months for the nine years, 1879–87, the temperature was slightly higher, the absolute humidity was slightly more, the relative humidity was much more, the day ozone was slightly less, and the night ozone was less.

Detroit reports 272 deaths during the month of February, in a population of 180,000, of which 61 were under 5 years of age. Death-rate per 1000, 19.69. From zymotic diseases there were 68 deaths, and from consumption, 20.

MINNESOTA *Bulletin* for February reports, infectious diseases: diphtheria, 17 cases, 4 deaths; scarlatina, 12 cases, 1 death. Diseases of animals: Glanders remaining on hand first of last month, 10; reported during the month, 24; killed, 2; released, 0; isolated, 23. Remaining, March 1st, isolated or not accounted for, 23—17 horses in one locality, but only 4 known to be affected.

St. Paul reports 137 deaths during the month of February, in a population of 125,000, of which 62 were under 5 years of

age. Death-rate per 1000, 13.15. From zymotic diseases there were 40 deaths, and from consumption, 9.

MISSOURI.—*St. Louis* reports 716 deaths during the month of January, in a population of 420,000, of which 272 were under 5 years of age. Death-rate per 1000, 20.45. From zymotic diseases there were 160 deaths, and from consumption, 71. During the month of February the number of deaths was 611, of which 208 were under 5 years of age. Death-rate per 1000, 17.48. From zymotic diseases there were 109 deaths, and from consumption, 73. Annual report for 1886: Deaths, 8268; zymotic diseases, 2371; constitutional diseases, 1605; local diseases, 3130; developmental diseases, 749; violence, 413. Of the deaths from zymotic diseases, 879 were from diphtheria and croup; 279 from malarial fevers; 149 from scarlet-fever, and 124 from typhoid-fever. Deaths from consumption, 915. Of the total number from all causes, 3434 were of children under 5 years of age. Death-rate (on estimated population of 400,000), 20.67.

NEW JERSEY.—*Hudson County* reports 426 deaths during the month of February, in a population of 258,434, of which 190 were under 5 years of age. Death-rate per 1000, 19.6. From zymotic diseases there were 34 deaths, and from consumption, 49.

NEW YORK.—The total reported mortality by State Board *Bulletin*, of 126 cities and towns, comprising 3,254,961 inhabitants, for the month of February, is 6653; of which 36.8 per cent were under the age of 5 years. From zymotic diseases there were 1058 deaths, a ratio of 159.00 per 1000 total mortality. From diarrhœal diseases, the ratio per 1000 deaths is 13.08; from typhoid-fever, 6.91; from croup and diphtheria, 63.58. From consumption the ratio of mortality is 143.20 per 1000 deaths, and 225.91 per 1000 above the age of 5 years. The combined death-ratio per 1000 from zymotic diseases, consumption, and puerperal diseases, is 315.12. From acute respiratory diseases there were 172.00 deaths per 1000 total mortality. No reports received from the cities of Buffalo, Long Island City, and Cohoes. Since the January issue 275 delayed returns for that month received.

The Sixth Annual Report of the State Board of Health, 1885, a volume of 579 pages, contains a brief introductory signed by all the members of the Board, calling attention to the increased activity and efficiency of the local boards throughout the State, consequent upon the recent amendments to the health laws in regard to the registration of vital statistics and increased sanitary powers of the local Boards. The necessity, and the obstacles in the way of sewerage, drainage, and a pure water-supply to numerous communities, are urged as subjects of primary importance in the future work of the Board, to the fullest extent of its powers, and for the promotion of these objects amendments to the general Drainage Act are recommended. "In investigating the occurrence of preventable sickness in localities especially afflicted, in determining the causes operating, and in devising proper remedies for the *in*sanitary conditions discovered, the Board requires the aid of expert skill of the highest order and the widest experience. . . . It is the duty of the Board to state that during the year many localities have needed expert help which they were not themselves able to secure, and which the Board, for the want of means, could not supply. . . . Larger means at the disposal of the Board would result in an improvement in the public health of many localities that the Board is not now able to help, except in words of general advice." The special report of the secretary (Alfred Ludlow Carroll, M.D.) is a particularly cogent statement of the difficulties in the way of full and accurate registration of vital statistics, even under the recent amendments to the law—chiefly due to the obtuseness of the people and the authorities in many communities on the importance of such recorded knowledge. The same cause operates in the toleration of local conditions promotive of "filth diseases." On the contrary, "the beneficial effects of local sanitary organization, in even partially awakening public attention to dangers of this kind"—storage of putrescent excrement in privy pits in close proximity to habitations, soil, and water pollution, etc.—"are already manifesting themselves in a gradual reduction in the mortality from the disorders which bear the closest relation to contamination of drinking water—namely, typhoid-fever and diarrhœal disorders." . . . The effect of general vaccination, urged and practised under the

auspices of the Board so successfully against the introduction of small-pox from Canada during the epidemic there, is referred to with eminent satisfaction. Reports of the several committees of the Board on Drainage, Food, Drug, and Beer laws; Registration and Vital Statistics; Effluvium Nuisances, and School Hygiene—all show a valuable record of profitable work by the Board, and the importance of sustaining it by needful appropriations. Copies of the monthly bulletins, from which we make abstracts monthly, are appended, together with a summary of the same, of mortality of the State and the prevailing causes for the year 1885.

"For the entire State the ratio per 1000 of deaths from all zymotic diseases to the total mortality in 1885 is 222.17, against 269.12 for nine months of 1884. This diminution, as will appear from the forthcoming report of the secretary, is largely in typhoid-fever and the diarrhœal diseases; the conjoined ratio per 1000 from these diseases is 104.07, against 146.40 in 1884. As these are especially controlled by public hygienic improvements, this indicates the efficiency of the sanitary work that has been done, and is emphasized by the ratio of diphtheria, which depends largely upon domiciliary conditions—viz.: 56.06 per 1000 total deaths in 1885, and 47.65 in 1884. These three typify the filth diseases. There is no material change in the other zymotic diseases.

"Estimating the present population of the State at 5,400,000, an annual death rate of 20 per 1000 would give 108,000 total mortality. The reported mortality, with about 3000 death reports received after the bulletin is issued, and the mortality of Buffalo, account for about 88,000 deaths. During the year about 5000 more deaths were reported than in 1884, showing that more local Boards are organized and that the returns are more complete."

New York City, 1,481,229: Deaths for the month, 2969; under 5 years, 1293; of zymotic diseases, per 1000, from all causes, 208.42. By croup and diphtheria, 263; typhoid-fever, 13; measles, 181; malarial diseases, 22; whooping-cough, 11; small-pox, 15; consumption, 538; acute respiratory diseases, 538. Death-rate, 26.04.

Brooklyn, 690,000: Deaths, 1162; under 5 years, 490; of zymotic diseases, per 1000, from all causes, 153.18. By croup

and diphtheria, 75 ; typhoid-fever, 2 ; malarial diseases, 12 ; whooping-cough, 3 ; scarlet-fever, 16 ; measles, 37 ; small-pox (including those who died in county hospital), 18 ; consumption, 154 ; acute respiratory diseases, 244. Death-rate, 21.89. (If the State Board *Bulletin* differs as widely from other city reports as it does from those of Brooklyn, it is of but little value. Our figures for Brooklyn are, with few exceptions, from the Health Department, and show 13 more deaths from small-pox, 4 less from typhoid-fever, and 7 less from scarlet-fever than the *Bulletin*.)

Rochester, 110,000 : Deaths, 168 ; under 5 years, 53 ; of zymotic diseases, per 1000, from all causes, 182.35. By croup and diphtheria, 22 ; typhoid-fever, 2 ; scarlet-fever, 1 ; consumption, 30 ; acute respiratory diseases, 13. Death-rate, 18.32.

North Carolina.—The first Biennial Report of the State Board of Health, of 144 pages, gives an account of the work accomplished by the Board from the date of its organization under present laws, March, 1885, to December 31st, 1886. The first subject of consideration was the reorganization of county boards of health, which has been and still is prosecuted, there being at the time of submitting this report 50 such organizations of the 96 counties in the State, in co-operation with the State Board. The reports upon public buildings and institutions have also been a characteristic feature of the work from the outset, and under its auspices the sanitary condition of the penitentiary, jails, and almshouses have greatly improved. And besides, dividing itself into the requisite number of committees : Epidemics, Water Supply and Drainage, Hygiene of Public Schools, Illuminating Oils, Climatology, Adulteration of Foods and Medicines, Vital Statistics and Sanitary Inspection, have all been subjects of investigation by the members of the Board, and much practical knowledge adduced. Appended is an admirable contribution on the "Care of the Eyes and Ears," by Richard H. Lewis, M.D., member of the Board. An excellent feature of this report is its freedom from redundancy, from all effort to make a volume out of the worked-over material from outside sources, already sufficiently familiar to practical sanitarians. To reduce the misery and promote the health of the people of the State of

North Carolina is the evident aim of the Board, and to do this, at the very outset of its work, it grappled those institutions and that portion of the people which most of all stood in need of its labors. The result is in a high degree creditable to the Board and an honor to the State.—*Bulletin* reports for the month of January unusual exemption from infectious diseases. Of 41 county reports, *typhoid-fever* is reported in 7 ; *diphtheria* in 6 ; *whooping-cough* in 7 ; *scarlet-fever* in 3, and *measles* in 9 ; but none of them prevail extensively—from one to three or four cases only, in any one county, except in Davidson, 9 cases of measles, 13 of whooping-cough, and 5 of diphtheria, are reported. *Hog cholera* is reported in 6 counties, and *chicken cholera* in 1.

Vital statistics for the month are appended of—

Wilmington : population—whites, 8000 ; colored, 13,000—21,000. Death-rates : white, 16.5 ; colored, 26.8—22.9.

Charlotte : population—white, 6000 ; colored, 5000—11,000. Death-rates : white, 10 ; colored, 19.2.

Asheville : population—white, 4500 ; colored, 1500—6000. Death-rates : white, 21.3 ; colored, 64.0—32.0.

Fayetteville : population—white, 2500 ; colored, 1800—4300. Death-rates : whites, 24.0 ; colored, 13.3—19.5.

For the month of February the *Bulletin* reports returns from 49 counties. *Whooping-cough* was more or less prevalent in 17 and *measles* in 10 counties ; *typhoid-fever* and *diphtheria*, of each in 3 counties ; *scarlet-fever* in 2 and *chicken-pox* in 1. The reports generally show an unusually good state of the public health. Hog-cholera continues in 3 counties.

Ratios of mortality for the month in

Wilmington,	white,	6.0 ;	colored,	19.0 : 13.8.
Charlotte,	"	16.0 ;	"	28.8 : 21.7.
Asheville,	"	29.3 ;	"	88.0 : 44.0.
Fayetteville,	"	14.4 ;	"	13.3 : 13.9.

OHIO weekly *Health Bulletin* for four weeks, ending March 4th, from 55 counties, reports cases of : Measles, 1482 ; diphtheria, 284 ; scarlet-fever, 240 ; croup, 33 ; whooping-cough, 122 ; typhoid-fever, 59 ; typho-malarial-fever, 31 ; small-pox, 3. Measles has decidedly declined—776 cases less than during the preceding five weeks. Diphtheria, 122 less ; typhoid-

fever, 17 less ; typho-malarial-fever, 14 less ; croup, 102 less ; small-pox, 1 less. Of the rest about the same.

At a recent meeting the following resolution was adopted :

Resolved, That the Ohio State Board of Health deems it necessary that each and every railroad train used in traffic within the State of Ohio shall be supplied with a stretcher and emergency case—contents of the case to be arranged by the surgeons of the railroad companies—to be used in event of sickness or injury, until the services of a physician can be secured ; that the employés of said railroad companies be instructed in the action to be taken in case of accidents ; and that a copy of this resolution be furnished, by the secretary, to the managers of all railroads in Ohio.

Cincinnati reports 419 deaths during the month of February, in a population of 325,000, of which 121 were under 5 years of age. Death-rate per 1000, 15.47. From zymotic diseases there were 74 deaths, and from consumption, 64.

Toledo reports 61 deaths during the month of February, in a population of 73,000, of which 15 were under 5 years of age. Death-rate per 1000, 8.35. From zymotic diseases there were 12 deaths, and from consumption, 11.

PENNSYLVANIA.—*Philadelphia* reports for four weeks, ending February 26th, 1721 deaths in a population estimated at 971,363, of which 599 were under 5 years of age. Death-rate per 1000, 23.0. From zymotic diseases there were 223 deaths, and from consumption, 267.

Pittsburg reports for four weeks, ending February 26th, 334 deaths in a population estimated at 200,000, of which 150 were under 5 years of age. Death-rate per 1000, 20.5. From zymotic diseases there were 80 deaths, and from consumption, 32.

Erie, for the year 1886, with a population estimated at 40,000 : deaths, 569—under 5 years of age, 237 ; zymotic diseases, 144 ; consumption, 74 ; acute lung diseases, 57. Death-rate, 14.2.

RHODE ISLAND.—*Providence* reports 199 deaths during the month of February, in a population of 120,000, of which 68 were under 5 years of age. Death-rate per 1000, 19.65. From zymotic diseases there were 39 deaths, and from consumption, 29.

SOUTH CAROLINA.—State Board of Health report for fiscal year ending October 31st, 1886, opens with a brief statement by F. F. Gray, M.D., chairman, of the advances made at the last session of the Legislature in sanitary legislation, the progress of practical work during the year in the abatement of certain nuisances, the importance and effectiveness of soil drainage, and the satisfactory administration of quarantine at the several stations, excepting that the buildings at the Port Royal and Georgetown stations are inadequate to the service and in great need of repairs and additions. He also refers to the excellent results following a four months' tour of sanitary inspection by the secretary, Dr. H. D. Fraser, who reports upon the same in detail, and "testifies to the increased interest and activity in sanitary work displayed by the large majority of the local Boards, and to the improved condition of health secured to the people as a result of their efforts, and of the greater interest and intelligence manifested by the people generally in managing their sanitary affairs, and thinks that the time is not far distant when those in authority will be held strictly responsible by the people for the existence of preventable diseases among them."

The committee on endemic and epidemic diseases reports, by Dr. J. F. Prioleau, chairman, that sanitary measures have been more generally attended to throughout the State, and that there has been coincidently a decrease in several diseases, notably in typhoid and typhus-fevers, though these still prevail, especially in the mountain regions. The returns of vital statistics are very meagre. From Georgetown, with an estimated population of 900 whites and 1900 blacks and colored (2800), death-rate of whites, 27.7; blacks and colored, 47.6. In Charleston, 27,605 whites, and 32,540 blacks and colored (60,145), death-rate of whites, 17.9; blacks and colored, 38.5. Of the causes of death, Dr. Horlbeck, City Registrar and Secretary of the Department of Health, Charleston, reports: "Consumption, as usual, claims its greatest harvest—51 whites and 209 colored; total, 260. One victim in every 290, or 1 death in every 8 deaths, was from consumption. The suggestion may be permitted that Charleston is growing healthier."

Dr. H. M. Stuart, Chairman of Board of Health, Beaufort, reports on the effects of the *earthquake*: "It was a curious

fact to note the number of persons, both male and female, particularly females, who were nauseated by the shock of the earthquake. This, I suppose, is attributable to fear; but these persons, although acknowledging themselves frightened at first, disclaimed any fear during the subsequent shocks, and continued to suffer from nausea. In a few other cases the effect of the nervous shock from the above cause was of a much more serious nature. In one case—of a young lady—it caused hysterical convulsions. I would not allude to the earthquake in Beaufort, as it was so much less violent than in some other places, but think a comparison of the effect of shock upon individuals in different localities might be interesting."

Dr. A. A. Moore, Chairman of Board of Health, Camden, also mentions similar effects of the earthquake on many persons, particularly the sick and feeble, at that place.

Dr. P. A. Wilhite, member of Executive Committee of the State Board, describes a peculiarly distressing condition of a family residing in Pickens County, laboring under the impression of having been poisoned by drinking water from a poisoned well; where, on account of the superstition of the people, he had great difficulty in obtaining the needful assistance to examine the said well, and in convincing the people that the sickness with which the family suffered was dysentery, greatly aggravated by neglected and filthy surroundings, in no respect whatever due to the well-water, which was found to be pure.

TENNESSEE *Bulletin* reports: "The principal diseases, named in the order of their greater prevalence in the State for February, were pneumonia, typhoid-fever, malarial-fever, bronchitis, rheumatism, dysentery, diarrhœa, and consumption. It is obvious that anything like full and accurate returns would furnish a different analysis."

In the chief cities the respective populations and death-rates are reported as follows:

Chattanooga,	white,	24.39 ;	colored,	42.00 :	24.39.
Clarksville,	"	9.60 ;	"	32.00 :	18.00.
Columbia,	"	10.03 ;	"	19.36 :	14.11.
Knoxville,	"	17.45 ;	"	24.93 :	19.08.
Memphis,	"	13.72 ;	"	29.82 :	19.44.
Nashville,	"	12.16 ;	"	17.76 :	14.12.

The month of February was characterized by an abnormally high temperature, with an excessive amount of rainfall and high winds, also for the absence of snowfall. The mean temperature was 49°.3, more than 4° above the highest February mean of the past four years, and as much as 15°.5 above the 1885 mean, which was the lowest of the period named.

VIRGINIA.—*Richmond* reports 135 deaths during the month of February, in a population of 100,000, of which 53 were under 5 years of age. Death-rate per 1000, 16.20. From zymotic diseases there were 17 deaths; from consumption, 18.

WISCONSIN.—*Milwaukee* reports 207 deaths during the month of February, in a population of 175,000, of which 60 were under 5 years of age. Death-rate per 1000, 14.2. From zymotic diseases there were 19 deaths; from consumption, 28.

ANNUAL REPORT OF THE COMMISSIONERS OF EMIGRATION OF N. Y. for 1886: Passengers arrived—cabin, 36,929 aliens and 41,721 citizens; steerage, 284,885 aliens and 16,002 citizens. Total, 321,814 aliens and 57,723 citizens, or a grand total of 379,537. There were 153 deaths and 76 births on shipboard. Alien immigration has increased 30,748 over that of 1885. Of the aliens arriving last year 180,478 were adult males, 85,368 adult females, and 55,968 children under twelve years of age. Of the arrivals, the following were the destinations: Connecticut, 8000; California, 5600; Canada, 2500; Dakota, 4500; Illinois, 25,500; Iowa, 7800; Kansas, 4300; Michigan, 9700; Missouri, 5300; Minnesota, 12,300; Massachusetts, 10,200; Nebraska, 5000; New Jersey, 10,400; New York, 110,000; Ohio, 9200; Pennsylvania, 42,000; Texas, 3000; and Wisconsin, 9100.

Of the immigrants, 23,839 were met at Castle Garden by friends, 535 husbands met their wives, and 502 parents their children. There were treated at the hospital 640 patients. Employment was found in 1886 for 8345 men and 5912 women. There were 997 immigrants returned as paupers, insane, cripples, and convicts.

FOREIGN REPORTS by Surgeon-General Hamilton's weekly abstract of consular reports received through the Department of State and other sources show that—

Cholera is still on the march. "The United States minister at La Paz, in his despatch dated February 6th, 1887, states that 'the cholera is the all-absorbing question of the day. The Government has organized very stringent preventive regulations, and is anxious that other nations should not disapprove of them. While they weigh very heavily on commerce, the people generally are inclined to approve of them. When the disease assumed an alarming shape in the Argentine Confederation non-intercourse was proclaimed by the Bolivian Government, and maintained by a cordon of the military. . . . The port of Arica, near Tacna, though closed to northern vessels, being open to the south, is liable to be infected at any moment. Hence a military force guards the mail route to La Paz, and prohibits all ingress from that direction.'"

From Santiago, Chili, the United States minister, in his despatch dated January 15th, states that "cholera is slowly extending along the valley of the Aconcagua, following the course of the river toward the sea, near Valparaiso. About 600 cases have so far been reported, of which about 250 have proved fatal."

"The United States Consul at Callao, in his despatch dated February 19th, 1887, states that no cases of cholera have appeared in Peru. The latest official intelligence is contained in the following cable messages from Santiago, dated February 15th, and from Valparaiso, under the same date: '*Santiago:* From Saturday to Monday noon, 435 cases and 213 deaths. It is difficult to obtain exact data.' '*Valparaiso:* I have visited the lazaretto established on the Baron Hill. Seven cholera patients. Freight from Santiago enters free. Passengers quarantined for twenty-four hours.'

"The United States Consul at Buenos Ayres, in his despatch dated February 5th, 1887, relative to cholera in the Argentine Republic, states that 'the disease seems at last to have quite run its course.'" In a cutting from the Buenos Ayres *Standard* of February 5th, it is stated that "The public health is no longer a subject of great anxiety, although cholera still lingers in this city and in many other parts of the Republic. The disease is wasting away gradually, and has lost much of its epidemical force. It has disappeared from Rosario, Cordoba, and Mendoza, is gradually wearing away in Tucuman

and northern provinces, and continues more or less stationary in this city and in Montevideo. Chili has also been invaded by the epidemic ; the disease is raging with terrible effect in the Chilian departments of Aconcagua, Andes, and Quillota. The daily mortality in Santiago, the capital, has been and continues to be heavy. It is noteworthy that both here and in Chili the epidemic has attacked the poor class only. There is no doubt that cholera is dying out rapidly in this city, but the disease is not abandoning the country as fast as we might wish. . . . Last month there were 596 cases of cholera in this city, of which number 336 were fatal."

"The United States Consul at Catania, in his despatch dated February 28th, in confirmation of his cablegram of the same date, states that the 15 cases reported were scattered throughout the city, not being confined to any particular locality ; that there was not more than 1 case in a house, with one exception, in which there were 2 ; that the physicians reported the disease to be without epidemic features. . . . Many of the streets are without drainage, the side streets and alleys are exceedingly filthy, the poorer classes are crowded together in poorly ventilated and comfortless rooms. As the heat of summer sets in, unless the dire malady be stayed, the sacrifice to death will be fearful. The people are greatly alarmed ; many of them are flying to the slopes of Etna."

By despatch from Panama, March 24th. The *Bolsa*, of Arequipa, of the 18th ult., says : "Cholera has appeared on the eastern frontier of Bolivia, where cases have occurred at Corumba and at Padilla, the capital of the Province of Tomina."

A Bolivian paper says : "The cholera has appeared in Valdivia—that is to say, in the Province of Tarija, in the Argentine Republic, and near the Bolivian frontier. Our authorities are doing their best to prevent it reaching here, and for this reason have cut off all communication with Corumba, where the disease is raging. In Tucuman there are daily about 200 deaths. The Corumba here alluded to is a Brazilian town on the Bolivian frontier, and from which it is separated by a gigantic range of the Cordilleras."

In Europe, at "Esseg, Austro-Hungary, there were 18 cases of cholera, and 6 deaths from that disease in the alms-

house hospital from January 27th to February 7th, 1887, but no cases in the city proper." Limoges, France, 3 deaths were reported from cholera during the month of January.

In Calcutta, during the two weeks ending February 19th, deaths from cholera reported, 36; January 30th to February 5th, 10 deaths were reported from the same cause.

Small-pox.—Deaths from small-pox reported during the week ending March 19th, in Glasgow, 1; Paris, 7; Rheims, 1; Brussels, 1; Trieste, 1. During the two weeks ending March 10th, in Guayaquil, 13. During the week ending March 12th, in Vienna, 1; Munich, 1; Pesth, 10; Prague, 5; St. Petersburg, 4; Warsaw, 5. During the week ending March 3d, in Cairo, 2; Alexandria, 3; Port Said, 4; Suez, 1. During the month of February, in Marseilles, 12; Kingston, Jamaica, 22. February 16–28th, in Nice, 4; Lisbon, 1. During the week ending January 22, in Rome, 5. During the month of January, in Bologne, 18. During the month of December, in Buenos Ayres, 6.

Yellow-fever.—In Guayaquil, during the two weeks ending March 10th, 17 deaths. During the month of February, in Havana, 6.

Measles, at the date of the most recent reports received, prevailed extensively in London, Liverpool, Glasgow, Bristol, Amsterdam, and Paris.

Diphtheria and *croup* prevailed—but much less extensively than in American cities—in Paris, Marseilles, Bordeaux, Bologne, Berlin, Hamburg, St. Petersburg, and Cairo.

Typhoid-fever in Paris, Marseilles, Bordeaux, Hamburg, St. Petersburg, and Cairo.

RÉSUMÉ OF THE MORTALITY STATISTICS FROM REPORTS THUS FAR RECEIVED OF CITIES OF 100,000 INHABITANTS AND UPWARD, BASED UPON THE MOST RECENT "ESTIMATED POPULATIONS," AT HOME AND ABROAD, IN THE ORDER OF THEIR LOWEST DEATH-RATES for the year 1886 (American cities in italics): *St. Paul*, 12.1; Hull, 18.7; Bradford, 19.1; Edinburgh, 19.1; Bristol, 19.2; *Chicago*, 19.4; *Providence*, 19.6; Sheffield, 19.7; Frankfort, 19.7; London, 19.8; Birmingham, 19.9; *Detroit*, 20.4; *Baltimore*, 20.4; *Philadelphia*, 20.6; *St. Louis*, 20.6; Bremen, 20.7; Liege, 20.9; Chris-

tiania, 21.3; *Brooklyn*, 21.8; Leeds, 21.8; Leipzig, 22.1; Newcastle, 22.3; Barmen, 22.4; Saint-Etienne, 22.8; Anvers, 22.9; Lyons, 23.0; Stockholm, 23.0; *Boston*, 23.1; Copenhagen, 23.2; Rotterdam, 23.6; Amsterdam, 23.6; Liverpool, 23.7; Belfast, 23.7; Elberfeld, 24.2; Hague, 24.2; Bordeaux, 24.5; Paris, 24.6; Nantes, 24.7; Brussels, 24.8; Glasgow, 25.1; Düsseldorf, 25.1; Dresden, 25.5; Berlin, 25.8; Magdeburg, 25.8; *New York*, 25.9; Bombay, 25.9; Manchester, 26.2; Vienna, 26.2; *New Orleans*, 26.5; Dublin, 26.9; Cologne, 27.2; Strasburg, 27.6; Gaude, 26.6; Dantzig, 27.9; Warsaw, 27.9; Bucharest, 28.1; Koenigsberg, 28.4; Bologne, 29.0; Hamburg, 29.3; Havre, 29.4; Munich, 29.9; Venice, 30.4; Nuremberg, 30.5; St. Petersburg, 30.6; Breslau, 31.4; Prague, 32.1; Marseilles, 35.0; Odessa, 37.4; Trieste, 38.0; Pesth, 39.4; Cairo, 48.5; Alexandria, 51.4. The highest death-rate of any city reported, at most recent dates, is that of Port Said (10,693), for the three months ending December 31st, 57.6 per 1000; for the year 1886, 41.0 per 1000.

Compulsory Vaccination was abolished in Zurich, Switzerland, in 1883. In 1882 there were no deaths from small-pox; in 1883, in 1000 deaths 2 were from small-pox; in 1884 there were 3 in 1000; in 1885 there were 17 in 1000, and in the first quarter of 1886 there were 85 in 1000.

A Large Hygienic Museum has recently been opened in Berlin. The rooms on the first floor, of which there are sixteen, contain exhibits relating to fire, building, heating, ventilation, lighting, water-supply, and road and street making. On the second floor are eighteen rooms, in which are shown objects used in civil and military nursing, clothing, baths, education, asylums, prisons, etc.

OBITUARY.

William Stephenson Robertson, President of the State Board of Health of Iowa, after an illness of about two months induced largely by overwork, died at his home, Muscatine, Iowa, January 20th, 1887, in the fifty-sixth year of his age. He

was born in Georgetown, Pa., but at the age of seven years moved, with his parents, to the then Territory of Iowa, making his home at Burlington; thence, when he was thirteen years old, moving to Columbus City, at which place, and subsequently at Knox College, Illinois, he received his academic education. He received his medical degree from Jefferson Medical College, Philadelphia, March 8th, 1856. Soon after receiving his degree he located at Columbus City, his old home, and there entered upon his brilliant professional and public career. Here he remained for twelve years in the enjoyment of a large and remunerative practice. On the outbreak of the rebellion he recruited the first company raised in the State and tendered it to the governor, though from some cause the company was not accepted until a later date. He was mustered into the United States service as major of the Fifth Iowa Volunteer Infantry on June 13th, 1861, and served his country with distinguished bravery. Upon the death of Colonel Worthington, Major Robertson was elected colonel of the regiment. At this juncture he resigned his commission as major, was called home on very important business, did not return to the service, and resumed his practice at Columbus Junction. Progressive in his ideas, and determined to stand in the front rank of his profession, and not satisfied with the knowledge gleaned from mere reading, though his practice was extensive, he left it, and spent the winter of 1868–69 in the hospitals of New York City, under the special direction of the late Professor Frank H. Hamilton. On his return from New York he sold his property in Columbus City and removed to Muscatine in the spring of 1869, where he remained in uninterrupted practice until the time of his fatal illness.

At a meeting of the Iowa State Board of Health, held at the Capitol, Tuesday, February 1st, 1887, Dr. J. F. Kennedy, Secretary, presented the memorial sketch, from which the above is taken, and the Board adopted the following report of a committee, as "expressive of its estimate of its loss, and its appreciation of his worth as a man, his ability as a physician; his efforts to promote sanitary reform; his fitness as a teacher; his philanthropic efforts to ameliorate the condition of a most unfortunate class, and his patriotism and valor as a soldier during the late war. As a physician he ranked among the

foremost in the State. Clear-headed, far-seeing, accurate in judgment, skilful in treatment, wise in counsel, he added to those qualifications a geniality of character and a sympathy of feeling which brought hope and comfort to the sick. No man was more highly esteemed and loved by his patients. Tears fell from many eyes as the throng of sorrowing friends passed by his bier to look for the last time upon the face of the dead. As a teacher of medical science he was connected with the medical department of the State University of Iowa since its organization, and was one of the ablest and most faithful members of the faculty. He advocated a high standard of literary and professional education. He was an active and prominent member of national, State, and county medical societies, and contributed by word and pen to their success. As a philanthropist his attention was early drawn to that unfortunate class of children whose intellectual progress had not kept pace with their physical growth. He conceived the plan of establishing an asylum where this class might be gathered and be afforded the care of the State and all the educational growth of which their condition admitted. With this end in view, he spared neither time nor labor. The Asylum for Feeble-Minded Children is largely the result of his persistent zeal, and is a lasting monument to his philanthropy. As a sanitarian he was becoming well known. For years he labored for the establishment of a State Board of Health, and when, by the efforts of himself and others, this Board was created by the Legislature, he became its first, and up to this time its only, president. We who were his colleagues know with what tireless energy he labored for the advancement of sanitary reform ; for the education of the people in sanitary matters ; his wisdom as a presiding officer ; his courteous discharge of his duties. His life has been one of large activities, of abounding usefulness, of good and generous deeds. Taken away in the prime of his power, he has left us the example of his works. A Christian gentleman, a faithful friend, a skilful physician, a wise teacher, an ardent philanthropist, a conservator of the public health, a lover of his country, we can, in bidding him a last farewell, fitly say, in the words of his pastor at his burial, ' Well done, good and faithful servant.' "

LITERARY NOTICES.

A PRACTICAL TREATISE ON OBSTETRICS. Vol. I. (4 vols.), Anatomy of the Internal and External Genitals, Physiological Phenomena (Menstruation and Fecundation). By A. CHARPENTIER, M.D., Paris. Illustrated with lithographic-plates and wood-engravings. This is also Vol. I. of the "Cyclopædia of Obstetrics and Gynecology" (12 vols.), issued monthly during 1887. New York: William Wood & Company.

Vol. II. of the same work treats of the Pathology of Pregnancy, and is also handsomely illustrated.

This is a particularly meritorious beginning of "Standard Medical Authors" for the current year, though not so named, being the beginning of a new and improved series of standard works, one volume monthly, to which the "Library" has given place. The work of Charpentier, to be published in four volumes, of which these are the first, is in itself one of the most complete works on this branch of medicine extant. The advances during the few years since it was first published, in 1882, have been well expressed by the accomplished translator and editor, Egbert H. Grandin, M.D., Obstetrical Surgeon to the New York Maternity Hospital, Instructor in Gynecology at the New York Polyclinic, etc., by condensations and notes, and by additions and substitutions to end of the illustrations, of which there are two hundred and sixty-seven wood-engravings and four colored plates in Vol. I., and forty-five engravings and two colored plates in Vol. II.—all executed in the best style of the art; and the publishers' part in other respects is of corresponding excellence with the author's.

PROCEEDINGS OF THE FOURTH ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF MASTER PLUMBERS OF THE UNITED STATES, June 22–23d, 1886. Pamphlet, pp. 240. This association continues to give evidence of the advance of plumbers in knowledge necessary for the practical exercise of their art. This is more particularly manifest in that portion of the report before us which deals with practical subjects—the president's address and the little discussion of what, we

fear, too many members of the association consider commonplace subjects. There is so much yet to be learned about the practical application of a thorough knowledge of hydrostatics and pneumatics with relation to the art of plumbing that it is a matter of surprise to find, almost without exception, the essayists appear to be tempted by the high-sounding title of "sanitary engineer," and like newly-born babes to whom everything is new, now that they have just begun to gain an insight into the benefits of practical sanitation, the plumbers assume that the whole burden of it rests upon their own shoulders, and felicitate themselves that doctors and architects have heartily joined with them, who have always done and who are still doing everything that it is necessary to do about the relations of plumbing to health. Physicians who have kept themselves abreast with progress in the advance of knowledge on the etiology of disease, and who have been foremost in the detection of bad plumbing by a knowledge of its results, are not only unnecessary, but meddlesome—they only know how to cure disease, nothing about how to prevent it. Chemists and engineers stand in the same relation—and all must now stand off. Hence we have here titles of essays as foreign to the work of the practical plumber as would be the soldering of lead pipe to the physician, or the fixing of the gradient of a drain-pipe to the chemist; and the text which follows such titles is chiefly remarkable for its crudity. THE SANITARIAN would be the last to say a discouraging word to ambitious plumbers, but it would be among the first to urge ambition in the right direction.

THE DOCTORATE ADDRESS, delivered at the Semi-Centennial Anniversary of the University of Louisville, March 2d, 1887, by DAVID W. YANDELL, M.D., Professor of Surgery and Clinical Surgery, sketches more men of mark who have filled chairs in that institution than appertain to any other institution for the same period in the United States. Caldwell, Miller, Flint, Drake, Gross, Bartlett, Eve, Bemiss, Bell and the Yandells constitute a galaxy of which the University of Louisville may well be proud. Here, within the limits of a malarial region, these great men gathered their first laurels, and several of them became renowned as great investigators as

well as great teachers, and had Dr. Billings made himself familiar with the facts, probably he would have thought the number of exceptions large enough to have prevented him from giving expression to the only original conception in his remarkable address before the British Medical Association, that "malaria and science are antagonistic."

THE NEW TREATMENT OF CATARACT PATIENTS, by JULIAN J. CHISHOLM, Surgeon-in-charge of the Presbyterian Eye, Ear and Throat Hospital, Baltimore (reprint from the *Maryland Medical Journal* of March 19th), accounts in particular of the advantages of the new isinglass plaster dressing after operations for cataract, which has been in constant use in the hospital under his charge for the preceding ten months, to the utter neglect of the old forms of compress and bandage dressings, and with such favorable results as to fully justify its continuance.

SCHOOL HYGIENE, a pamphlet of thirty-two pages, by E. M. NELSON, M.D., St. Louis, reprint from the St. Louis *Courier of Medicine*, is a valuable contribution to a subject of universal interest, and which all parents and teachers would do well to read.

THE PUMP CATECHISM, by ROBERT GRIMSHAW, M.E., etc., is an illustrated four-by-six manual, of much practical utility to all persons who would understand the mechanism and construction of all kinds of pumps. Practical Publishing Co., 7 Dey Street, New York.

COCOA AND CHOCOLATE, a short history of their production and use, with a full and particular account of their properties, and of the various methods of preparing them for food, is a little manual which should be obtained by all persons who would be possessed of this knowledge and know how to use it to the best advantage. Walter Baker & Co., Dorchester, Mass.

HOT WATER AND BEEF PLANS IN CHRONIC DISEASES. By EPHRAIM CUTTER, M.D. New York: W. A. Kellogg. A book of thirty pages, which gives the directions for drinking hot water to the best advantage in certain forms of indigestion; and the "Salisbury Plans of Diet in Chronic Diseases, with

Directions for Preparing Beef Pulp," and its indications and uses. It contains a good deal of information in small space, on dietetics for the nursery and for invalids, which all medical practitioners and professional nurses ought to possess.

WEAR AND TEAR; OR, HINTS FOR THE OVERWORKED. By S. WEIR MITCHELL, M.D., LL.D., Harv., etc. *Fifth edition.* Philadelphia: J. B. Lippincott Company. Price $1. This is an essay of seventy-six pages, printed in gold, from which all readers may gather coin with which the burdens of life may be made lighter, and green old age more easily attainable.

A MANUAL OF THE DISEASES OF THE SKIN. By BALMANO SQUIRE, M.B., Lond., Surgeon to the British Hospital for Diseases of the Skin. London: J. & A. Churchill. A 12mo of one hundred and ninety-four pages, which treats of the common disorders of the skin, aside from eruptive fevers and cancerous affections. The author sticks to the classification of Willaw, as being the most easily intelligible, and his description and treatment is singularly devoid of redundancy in all respects, but sufficiently comprehensive for the object in view —to furnish a concise introduction to the study of skin diseases.

A CODE OF RULES FOR THE PREVENTION OF INFECTIOUS AND CONTAGIOUS DISEASES IN SCHOOLS: Being a Series of Resolutions passed by the Medical Officers of Schools Association. London: J. & A. Churchill. Price one shilling. A pamphlet of thirty pages, of great practical utility to all school authorities and sanitary inspectors of schools.

PHYSICAL CULTURE IN AMHERST COLLEGE, by NATHAN ALLEN, M.D., LL.D., a paper read at the Tenth Annual Meeting of the American Academy of Medicine, at Pittsburg, Penn., October 12th, 1886, is a brief but comprehensive essay on the scope of the subject treated of, as practised in Amherst College, where it was first introduced on the recommendation of the author in 1860. Dr. Allen may, therefore, be well regarded as one, if not, indeed, the first of the pioneers of physical culture on a scientific basis in American colleges.

A DISSECTION OF MR. J. PICKERING PUTNAM'S REPLY TO GLENN BROWN'S REPORT ON TRAP SIPHONAGE is a

two-page rejoinder to Mr. Putnam's brochure noticed in February number. Mr. Brown concludes as follows :

"(1) I see no reason to change my deduction that properly vented traps are safe against siphonage and back-pressure.

"(2) I find the seals of anti-siphon traps, Mr. Putnam's (the 'Sanitas') included, are not anti-siphoned under all contingencies, and that they do not withstand back-pressure.

"(3) The necessary expense in protecting the seal of traps by ventilation is not only justifiable but expedient.

"(4) I only see one practical way of preventing back-pressure—that is, by ventilation."

DANGERS TO HEALTH, a well-illustrated little work by J. PRIDGIN TEALE, M.A., Surgeon to the General Infirmary of Leeds, first published eight years ago (see THE SANITARIAN, Vol. VII.), and since passed through two or three editions, appears to have recently fallen upon fallow ground. In the Boston *Medical and Surgical Journal*, of March 3d, Dr. Harrington calls attention to the fact that the *Annals of Hygiene*, "official organ of the State Board of Health of Pennsylvania," is recently reproducing Mr. Teale's work as its own ! The Board owes Dr. Teale an apology.

SOME NEW MEDICAL PERIODICALS.

The Medical Register, a weekly of twenty-four pages, seven by twelve, edited by Drs. John V. Shoemaker, of *The Medical Bulletin*, and Dr. William C. Wile, of *The New England Medical Monthly*, published every Saturday by the Medical Register Publishing Company, Philadelphia, at $3 a year, eschews all medical society proceedings as too stale for the vanguard, but, instead, fills from four to eight pages, weekly, with original contributions ; about as many more with hospital reports and clinical lectures ; has a page or two of trenchant editorials, and the rest with a "*résumé* of everything worth reading in the current medical literature !" It is a live periodical, but of the *résumé* THE SANITARIAN prefers the remainder.

The South-Western Medical Gazette, a monthly, thirty-two pages, five by eight, edited by Drs. M. F. Coomes and J. B. Marvin, published by The Bradley and Gilbert Company,

Louisville, Ky., at $1 a year, appears, "not to fill an acknowledged want," but to contribute to the general stock of medical progress. And to this end it commands contributions of a high order, and in its editorial pages gives evidence of resources and scope of observation abundantly significant of its power to hold its own among the foremost.

Progress, a monthly, forty-eight pages, five by eight, edited by Dudley S. Reynolds, A.M., M.D., Louisville, Ky., $2 a year, very handsomely maintains the significance of its title, takes up the smallest possible space with head-lines, evidently exerts itself toward the more practical rather than the speculative field of inquiry and succeeds.

The Southern California Practitioner, a monthly, forty-eight pages, four by seven, now in its second year, edited by Drs. J. P. Widney, Joseph Kurtz, and Walter Lindley, Los Angeles, Cal., limits its scope pretty much to its own vicinity; but this is a good scope, particularly that feature of it which appears to be a special subject of study and presentation—the climatology of this region, as related to pulmonary diseases. A fruitful field, of which there is much yet to be learned of great practical importance to physicians throughout the country; and as a means of learning we cordially recommend *The Southern California Practitioner.*

The Pacific Record, a monthly *résumé* of medical and pharmaceutical progress, thirty-two pages, six by ten, Charles N. Moore, M.D., editor, San Francisco, $2 per annum, is now three-quarters of a year old. Every number has been well filled with choice matter, with the evident purpose of giving that which is of the best quality from all sources, selected as well as original, adapted to the every-day requirements of the medical practitioner. The March number contains a particularly sterling, and, it is to be hoped, also stirring editorial on "Sanitation in San Francisco," which appears to be among the things that are not, but instead thereof disease-bearing milk, choked sewers, surface filth, and a perennial harvest of infantile mortality and tuberculous bacilli. The *Record* is evidently on the right track to make itself felt, and eminently worthy of support.

THE SANITARIAN.

MAY, 1887.

NUMBER 210.

REPORT OF THE SURGEON-GENERAL U. S. NAVY FOR 1886.

AMONG the first subjects urged upon the attention of the Secretary of the Navy, in the report of the Surgeon-General for the year 1886, is the depletion of the Medical Corps, its vacancies not having been filled for several years by reason of the inadequate inducements to competent men to enter the service. "The Army Medical Department has qualified applicants far in excess of its needs, attracted by better pay, well-defined rank, and more satisfactory professional position;" hence, "since 1870 more than thirty young medical officers have resigned (three of them to enter the Army Corps). . . . The Bureau has not been willing to lower the standard of requirements, and it is impossible, with the present inducements offered, to find young medical men possessing the necessary qualifications who are disposed to become medical officers of the Navy." To persons acquainted with the official status of the Medical Corps of the Navy it is by no means a matter of surprise that the persistent injustice to which it has been subjected should have at length brought it to the condition which now exists. On the contrary, the surprise is that the alternative which is now placed before the Secretary of the Navy and Congress has not long since been made to appear. It is, simply: Shall the Bureau lower the standard of professional requirements, and so open the door to an accession of membership suited to and content to occupy the degraded status to which the line officers would consign them, on an equality with the "medical officers" of emigrant ships, and in every way calculated to disgrace the service, or shall it continue to

uphold the standard of professional learning and dignity of character which has acquired for the Medical Corps of the Navy a distinction which is second to no body of medical men in the world?

It is a defect of the report before us that the Surgeon-General has not devoted more space to the cause of this grave condition of the corps. During his now almost forty years' service he has had abundant opportunity for a keen appreciation of the causes which have led to it, and conversely why the Medical Corps of the Army has become so much more attractive "by better pay, well-defined rank, and more satisfactory professional position." These, it is true, are potent words, and, while elaboration of them appears not to have been deemed necessary to this report, it is sincerely to be hoped that they may not be lost upon the powers that be by an exclusive devotion to the material interests of the Navy; and that the time is not far distant when the Medical Corps will be placed upon the footing which it so well merits by maintaining its high standard of excellence, notwithstanding the discouraging circumstances with which it has been long beset.

Of the sick, tabular statements are given for the year ending December 31st, 1885, as follows:

General aggregate of force afloat: Remaining (sick) from last year, 164; admitted, 8429; discharged to duty, 7590; invalided to hospital, 727, from service, 33; died, 52; remaining at the end of the year, 191; total number of sick days, 68,632.

General aggregate of naval hospitals: Remaining from last year, 214; admitted, 1031; discharged to duty, 866; invalided to hospital, 34, from service, 163; died, 43; remaining at the end of the year, 139; total number of sick days, 64,399.

General aggregate of navy-yards and stations: Remaining from last year, 38; admitted, 2399; discharged to duty, 2160; invalided to hospital, 224, from service, 7; died, 14; remaining at the end of the year, 32; total number of sick days, 15,752.

Ratio per 1000 of admissions for each class of diseases:

Zymotic diseases	131.+
Constitutional diseases	99.+

Diseases of the nervous system	48.+
Diseases of the eye	13.+
Diseases of the ear	6.+
Diseases of the teeth	2.+
Diseases of the circulatory system	8.+
Diseases of the respiratory system	72.+
Diseases of the digestive system	158.+
Diseases of the genito-urinary system	80.+
Diseases of the locomotive system	3.+
Diseases of the integumentary system	102.+
Diseases of the absorbent system	17.+
Non-malignant tumors and cysts	1.+
Violent diseases and deaths	154.+
Feigned diseases	.10
Daily average number of sick	188.+
Daily average each case was under treatment.	7.+
Admissions per 1000 of mean strength	917.+
Invaliding per 1000 of mean strength	81.+
Deaths per 1000 of mean strength	5.+

An increase over the average mortality of .60 per thousand for the past 15 years, during which it has been 4.40 per 1000.

Of the whole force afloat there were 2 cases of tuberculosis ; 1 died, and the other was transferred to hospital.

Of the epidemic influences affecting the mortality of the force afloat during the year, *cholera* occurred aboard the Ossipee and Enterprise, on the Asiatic Station, a total of 9 cases, of which 6 were fatal. *Yellow-fever* aboard 6 vessels : In the North Atlantic Squadron, aboard the Galena, 5 cases and 1 death ; Swatara, 1 case, recovered. In the South Atlantic Squadron, aboard the Lancaster, 2 cases, transferred to hospital at Rio de Janeiro and died. In the Pacific Squadron, aboard the Adams, Surgeon William A. Corwin died soon after reaching Panama, where he contracted the disease ; the Lackawanna, 6 cases, 2 deaths ; the Shenandoah, 1 case, transferred to hospital at Callao and died : 16 cases, 9 recoveries and 7 deaths.

THE MUSEUM OF HYGIENE.

Of special reports, the first is on the Museum of Hygiene, by Medical Inspector T. J. Turner, in charge, which shows a

continuous increase in the collection of sanitary and hygienic appliances, and that much more room is required for its proper display. The chemical, physical, and biological investigations here conducted also labor under great disadvantages on account of inadequate space, although much valuable work has been accomplished.

"Analyses have been made, both chemical and commercial, of various proprietary disinfectants; examinations of wood preservatives; oils presented by the Bureau of Steam Engineering, for lubricating purposes; gas, air, and water analyses have been made, and tentative experiments have been conducted toward improving water analysis; improving the methods of determining organic matter in the air," etc., of great importance in relation to the protection of health from various points of view, and abundantly justify the recommendation of the Surgeon-General that the attention of Congress be urged to the necessity for a building with appointments commensurate with the objects of the institution.

The Museum has already become an educational force of great magnitude to persons of all professions interested in the best means of protecting health and life, and it is the daily resort of physicians, plumbers, architects, and others seeking information on sanitary questions.*

SOME NEW REMEDIES.

Kola.—Medical Director A. L. Gihon, besides his report on the Naval Hospital, Washington, under his charge, makes an interesting report upon kola. He quotes from Mr. Thomas Christy, of London, Fellow of the Linnæan Society, who in 1878 found that the reports concerning the kola-nut brought by travellers from the west coast of Africa were really worthy of credence. Among the most singular of its properties first brought to notice was that of clarifying and improving beer and spirits; and from Heckel and Schlogdenhauffer the further property of purifying foul water, and of rendering tainted meat edible, the former effect, at least, being probably a mechanical result due to the mucilage contained in the nut, as in the case of egg albumen or isinglass. . . . "Like the *Erythroxylon coca* of Peru, its use was said to enable the natives

* For this report in full, see THE SANITARIAN, Vol. XVII., p. 481.

of the country of its growth to endure prolonged exertion without fatigue and upon a mere modicum of food, while the whites living among them escaped the constitutional effects induced by climatic influences by chewing a small quantity before their meals, and the negroes themselves believed it to be a sure prophylactic agent against dysentery, as the Indians of the east coast of South America ascribed similar preventive properties against bowel affections to the habitual use of guavana. Among the men on the estates and in the garrison towns of West African settlements kola has the well-founded reputation of dissipating the effects of alcoholic debauch, and, from what is now known of its therapeutic properties it is undoubtedly true that it does overcome the stupefaction and confusion of intellect which follows drunkenness. It is even maintained that it destroys the appetite for intoxicating drink, and that after the use of the kola cure the drunkard cannot return to his cups for some days without feeling nauseated. Finally, it is believed by the natives to have aphrodisiac properties.

"The kola of commerce is the seed of the fruit of the *Sterculia acuminata*, a tree from thirty to sixty feet in height, indigenous to the west coast and neighboring territory of Africa between Sierra Leone and the Congo. The ripe fruit is a brownish-yellow pod from three to six inches long and about two and one half inches wide, which contains from five to fifteen red or white seeds, weighing from five to twenty-five grains each. The tree flowers continuously, and the nuts are collected twice a year. The seeds are removed from the husk, freed from their episperm, and carried to Gambia and Gorée on the coast, whence they are transported by caravan to the interior of the continent, where they are in demand for the several purposes indicated. . . .

"Recently it has been found that the kola-nuts can be ground and made into a paste resembling the chocolate made from the roasted kernels of the *Theobroma cacao*, and it was in this form of preparation—*kola paste*—that the remedy . . . came into my hands for experimental use. . . .

"The kola was prepared for administration after the usual manner of a chocolate beverage, by trituration with sugar and solution in boiling milk, and was taken hot, in quantities of

from ten to fifteen grains, midway between breakfast and lunch, and again between lunch and dinner, to avoid interference with meals. Taken at night it would probably have caused wakefulness. Its somewhat disagreeable taste and odor were masked by the addition of the ordinary flavoring vanilla extract. If allowed to cool a yellowish gum separated which was not dissolved in reheating, and was extremely unpleasant. Its use in two cases of severe nervous disturbance, characterized by headache, nausea, anorexia, insomnia, despondency, palpitation, etc., has been followed by the most salutary results—relief of the headache and palpitation, recovery of the appetite, restored sleep and muscular vigor, and no such ill-effects as gastric disturbance or constipation, as sometimes follow the use of chocolate or other nervous stimulants."

Medical Inspector A. Hudson also makes a brief report on the same subject with equally satisfactory results. In a case of much debility, distressing irregularity of the heart's action, etc., after about three months' use of ten grammes of kola paste once daily in hot milk, prepared in the same way as chocolate, the results were "strikingly satisfactory."

Paraldehyde in Insomnia.—Surgeon J. R. Tryon reports the case of a man who had been in the service about twenty-three years, and whose health had always been good until October, 1882, when he became afflicted with insomnia. By change to shore duty during the following year he obtained relief, but on his return to sea service on the Mexican coast the attack returned, together with general debility. In October, 1883, he was detached and sent home. He went to the mountains of North Carolina and remained there until June, 1884, when he was again ordered to sea. During the time spent on shore the insomnia gradually disappeared, but his general health improved slowly, and at the time he reported on board for duty he was far from well and required tonics. After several months the attacks of insomnia again recurred. Various hypnotics, sedatives, tonics—in fact, every remedy that promised success—had been used, but only with temporary relief. His habits were good; tobacco, tea, coffee, and everything that might contribute to his affection were excluded. The only discoverable organic lesion was slight hypertrophy of the

heart. Urine contained phosphates in excess. About this time he was ordered Horsford's Acid Phosphate and the compound syrup of the hypophosphites, which, added to longer stays in port, produced some beneficial effect. "He had himself noticed an account of the action of paraldehyde, and requested that it be tried on him. The first dose was 2 c. c. taken in the daytime, but probably on this account without effect. The second dose was 3 c. c., which produced four hours' sound, uninterrupted sleep, something quite unusual for him. Subsequently, doses from 3 to 4 c. c. were given about twice a week only, after vainly trying for about an hour to sleep without it. These doses have always been found sufficient to produce sound sleep, sometimes for the best part of the night, and never for less than two hours at a time. To avoid a diminution of effect, it has been given only when absolutely necessary, and so far, two, or at most, three, doses a week have been sufficient. The sleep is sound, dreamless, and, unlike chloral or morphia, leaves no unpleasant effect. . . . It has a cooling taste, produces a feeling of warmth in the stomach, but has no effect on the heart, pulse, or temperature. His general health since he has been taking the drug, and been able to procure refreshing sleep, has greatly improved; but this may be partially due to the phosphate which he is still taking."

INFECTION AND DISINFECTION.

Consumption.—Medical Inspector A. A. Hoehling's report upon the Flag-ship Pensacola, Mediterranean Station, states that "Among the native poor of Madeira consumption is on the *increase*. This is attributed to the use of the cast-off clothing of patients who come here to die, and to the mode of living of the natives. Their diet consists of a little meal-mush, and a little cheap fish on rare occasions. They live in damp hovels in the mountains, and general squalor, and many work hard in the stooping posture at making cheap laces and wooden wares, etc.; they have also inherited poor bodies from ancestors who lived as they live.

"As the bacillus of tubercle requires a high temperature for cultivation in the laboratory—at least 90°—may not a continuously warm climate favor its liability at Madeira, where it

is being added to almost daily by fresh importations. The spreading of the disease among the natives, and the fact that the climate does not seem to arrest the disease in patients who come from abroad, seem to furnish some grounds for an affirmative answer. If this hypothesis is ever proven it will give us good reason for sending consumptives to a cold climate, like Minnesota affords, where the bacillus is not favored with a high temperature to increase and multiply. Experience already appears to furnish good arguments to sustain this view also, for patients who are not too far advanced do better in Minnesota than in Madeira and like climates. Of course the advanced stages of the disease do badly everywhere, and suffer *less* in a mild climate; so for euthanasia we may continue to recommend the latter." . . .

Cholera.—"There has been considerable cholera at various parts of our station, but the disease had always disappeared about a month before our arrival. . . . On the 21st of November (1885) we arrived at Villefranche-sur-Mer, near Nice, where the cholera had also made an incursion during the summer and early autumn. . . . Cholera appeared to a very limited extent at Gibraltar, but, owing to judicious management and military law and discipline it did not effect a lodgment. In the Spanish towns across the line the disease had full sway, and even a few days ago I heard that a couple of deaths from cholera had just taken place at Ageçiras, opposite Gibraltar. The governor did not quarantine the latter place, but used all other precautions. By the advice of the surgeon-general the latrines were guarded, and if a soldier used them twice in a day he was taken to the hospital and put under prophylactic treatment. One officer and a few soldiers only died of the disease among the garrison; and the deaths of civilians and people from over the Spanish line who died in Gibraltar made up a total of 30 deaths while the disease existed at that place. At Nice, near Villefranche, which was not invaded, about 150 deaths from cholera occurred during the summer and autumn. I was told that the district was supplied with drinking water by a fountain near the cathedral, and that this was fed by a stream which flowed by the camp of troops just from Tonquin, among whom cholera had prevailed. The soldiers washed clothes, etc., in the stream. . . .

"As money could be lost by the spread of such a disease in Nice, money and intelligence were applied to stop it in haste, and the desired end was reached. By isolation of the infected districts, cleanliness, boiling the drinking water, and destroying infected articles, the disease can be limited or exterminated. . . .

"On board a vessel of war the disease ought to be gotten rid of better than in almost any other situation, and I do not believe it to be necessary to damage clothing and furniture by internal steaming for a single light invasion of the disease. If possible, cases of the disease should be sent on shore or to a hospital-ship as soon as possible ; if this cannot be done tents should be placed on the spar-deck for the patients. All discharges should be disinfected with the sulphate of iron, muriatic or carbolic acid at once, and the 'head' should be well supplied with disinfectants. After the cases are all away from the ship or cured, the old 'head-chutes' ought to be destroyed or cast away at sea, plenty of washing and new paint and whitewash, with sulphurous or nitrous acid vaporization near suspected portions of the vessel, will be sufficient for a first or a light invasion of a ship. For more serious epidemics on board nothing is so good as steaming, of course, but the use of distilled water on board ship is our great safeguard against cholera, and will probably render serious epidemics impossible on war vessels for the future."

The cholera on board the Ossipee, of the Asiatic Station (of which an abstract report was published in THE SANITARIAN, Vol. XV., p. 457), and the process of disinfection, are reported in detail by the medical officer of the ship, Surgeon Alfred F. Price. (The number of cases and deaths are stated on a preceding page of this review.) "On August 10th, 1885, this ship anchored in Nagasaki Harbor, Japan, leaving again on the 27th of the same month. There were rumors of an outbreak of cholera in the town, and on the night of the 22d of August, by order of the Admiral, all liberty was stopped. After our departure cholera spread in Nagasaki and assumed a very virulent and fatal form. In one of the newspapers it is stated that from the first appearance of the disease, in July, up to and including the 21st of September, 3253 persons are officially stated to have been seized with cholera in Nagasaki

Ken, and 2023 died. In Taokashima (coal mines), out of 792 cases, 652 ended fatally.

"On the 28th of August, while the ship was in the inland sea, two cases of epidemic cholera appeared on board. . . .

"The stools were disinfected with solution mercuric chloride, 1 to 1000, and sick-bay washed with it. . . . August 29th, the air-ports and hatches leading to the upper deck were closed and steam was turned on the deck from the main boilers through an open valve of the capstan engine. The bags of the men containing their clothes were placed on the deck, each man having just previously changed his clothes completely. The steam was poured on the deck in volumes for two hours, and after opening up the deck it was discovered that the steam heat had shrivelled up the leather left on the deck and blistered the paint-work all over the deck. Two pocket-cases with their contents were very much injured, the cases being totally destroyed. These instruments were in the table-drawer. The other instruments, being in a locker, were better protected, but the boxes of many of them were warped and injured. The 'head' and officers' water-closets were disinfected with crude carbolic acid, 1 to 20, thrice daily. The vessel arrived at Kobé in the night, August 29th, and was at once put in quarantine. On the morning of August 30th put all the hammocks open on the berth-deck, and, closing deck up again, burned 25 pounds of sulphur on the deck, which was all there was on board.

"On a sandy beach at Wada Point, about four miles from Kobé, there is a Japanese quarantine station. There is a large two-story building for the reception of the crews of infected ships, and near it a disinfecting establishment, wherein there are baths heated by steam and a chamber arranged for the disinfection of clothing by dry heat. About a mile below these there is a hospital for affected men. It is built of one story, on the pavilion plan, with ridge ventilation, and a porch running along in front of the rooms. It was decided to send as soon as possible the diarrhœa cases out of the ship, of which there were about fifteen apparently mild cases. The arrangements being delayed, the men, seventeen in number, were not sent until midnight, by which time two of the cases showed very decided signs of cholera. Passed Assistant Surgeon A. C. Russell went to the hospital in charge of the men, and remained in

charge. Neither the hospital nor other buildings had apparently been used before. After the appearance of two more cases of epidemic cholera, on August 30th, it was decided to disinfect the ship more thoroughly, as well as the men ; so on August 31st sent on shore 147 men, with their bags and hammocks. The men remaining on board were sent on shore the following day with their effects, to be disinfected, being relieved by a party of purified men from those on shore. By this time the ship had been disinfected. The method pursued by the Japanese authorities was as follows : Every man was given a hot bath, with soap, and afterward given a kimono to wear ; the clothes he had been wearing were baked in the dry-heat chamber. The officers were all treated in this manner. The men's bags and hammocks were baked in this chamber, the men's things being taken out of their bags and the hammocks opened up. Every man on coming up from the quarantine hospital discharged is bathed, and his clothes baked, before he rejoins his comrades at the quarantine station. The hammock and bedding of every man who had suspicious diarrhœa at the hospital was burned. A tent is erected near the main house, where the crew is kept, to which every case of diarrhœa is removed and watched. Tincture of opium and acid sulph. dil. is given after every passage, and at least thrice daily. If the stools become frequent and watery the men are sent to the hospital in Jin-riki-chas, which are frequently disinfected.

" On the 1st of September disinfected the ship. . . . The following amounts of sulphur were consumed : In ward-room and steerage, 41 pounds ; berth-deck, 60 ; forecastle, 28 ; cabin, 18. These places were kept closed for six hours, except the forecastle, which was imperfectly closed with canvas for four hours. The ' head ' was washed out with steam hose ; the chutes plugged up, and filled with sol. calx. chlorinata, 1 pound to 5 gallons, which was sprinkled likewise all about the ' head.' The boards in use over the iron tanks were burned. The bilges forward were disinfected with sol. calx. chlorinata. On September 2d the engine and fire-room were shut up as thoroughly as possible, and, together with the shaft-alley, was fumigated with burning sulphur. The store-rooms were broken out and fumigated with sol. calx. chlorinata. The work was continued daily ; the hold was separately fumigated

with sulphur fumes, and then broken out and whitewashed with lime and chloride of lime. The decks, hammock-nettings, head, and boats were sprinkled daily with chloride of lime solution.

"The stationary water-closet and bath-tub were removed from the sick-bay and thrown overboard, as the discharges of three cholera patients had contaminated these things and it was necessary to thoroughly purify that end of the sick-bay. . . .

"September 14th. Twelve days having elapsed without a case of cholera, the well men were allowed to return on board ship. . . . On September 20th there occurred another outbreak of choleraic diarrhœa, which was considered indicative of the existence of the cholera poison on board the ship. Five men were sent on shore on the evening of the 20th, of whom three developed very serious and suspicious symptoms. There were fifteen diarrhœa cases sent on shore in three days. On the morning of the 21st of September the head was again shut up. The boards in use for seats were burned and the iron tanks were taken on shore and filled with straw and tar and set on fire. Subsequently they were sprinkled with solution hydrarg. bichlor., 1 to 666. The chutes, being plugged up, were filled with the same solution, which was, moreover, sprinkled in and around the head freely. September 22d the berth-deck was disinfected with burning sulphur (80 pounds). The mess-chests and the chests in the tops, and such things not taken on shore, were placed on the berth-deck and submitted to the action of sulphur for six hours. The spar-deck and top-gallant forecastle sprinkled and washed with solution calx. chlorinata (1 pound to 4½ gallons water); the rigging, ropes, boats, and forecastle awning were sprinkled with 1 to 60 Calvert's carbolic acid, No. 5. The mess gear was boiled before it was sent on shore to the men. All of the men were to-day (September 22d) sent on shore and bathed, and the clothes they had on baked, as well as their hammocks and mattresses. Their bags were taken from them and will not be returned until they and their contents are baked. The heat in the dry-heat chamber reaches 230° F., and, perhaps, more. The things are baked for two hours. The cases of diarrhœa are isolated in a small frame house of two rooms, erected by the commanding officer for the purpose. The men do not

return to the main building until they and their hammocks and clothes have been disinfected as above described. The hammocks belonging to men deemed sick of contagious diarrhœa were burned. . . .

"There seems no doubt but that the contagion of this disease came on board this ship while at Nagasaki from the disease existing at that place. The means of contagion has not been ascertained. . . .

"The epidemic of cholera which existed in Nagasaki during July, August, and September, with great virulence, extended its effects to Kobé during October, so that on our return there from a sea trip on October 13th we found about a dozen cases occurring daily, of which about three fourths were fatal. On our arrival at Yokohama, on October 20th, we found that cholera existed in that place."

THE NAVAL ACADEMY.

Surgeon T. C. Walton reports the completion of sundry important improvements of this institution, which appear to have been begun under the management of Medical Director Gihon and the superintendency of Rear-Admiral C. R. P. Rodgers ten years ago. They consist of such rearrangements, additions, and fittings as a well-appointed surgeon's office and laboratory; good quarters for apothecary and nurses; enlarged hospital accommodations, including means for isolating a patient; adequate and efficient plumbing; steam-heating and improved ventilation.

The "Sick Quarters" afford accommodation for 30 patients, allowing over 5200 cubic feet of air space to each one; and in an emergency room for 50, with 3500 cubic feet of air space each, exclusive of commodious and well-ventilated halls.

The sewerage has been thoroughly overhauled and repaired, is efficiently ventilated, and all fixtures connected with it "doubly trapped." The sewer leads directly to the river, "is frequently flushed, as, in fact, all drains and sewers in the Academy grounds, and disinfectants are freely used in them. . . .

"It would seem that the present capacity and arrangement of the building should answer the requirements of the Naval Academy for many years."

REPORT OF THE SURGEON-GENERAL OF THE ARMY FOR THE FISCAL YEAR ENDING JUNE 30TH, 1886.

THIS report sums up the medical, surgical, and meteorological statistics for the calendar year ending December 31st, 1885, as follows: Average mean strength, white, 21,944; colored, 2194 : 24,138. Admissions to sick report, white, 29,689; colored, 3301 : 32,990. Ratio of admissions to 1000 of mean strength, white, 1353; colored, 1505 : 1367. Admitted for disease, white, 24,353; colored, 2639 : 26,992. Ratio per 1000 of strength, white, 1110; colored, 1203 : 1118. Average number constantly sick during the year, white, 898; colored, 93 : 991. Average days of service lost by sickness to each man of the force during the year, white, 15; colored, 15.5 : 15. Number of deaths from all causes, white, 168; colored, 14 : 182. Ratio per 1000 of mean strength, white, 7.7; colored, 6.4 : 7.5.

Compared with the average rate for ten years preceding, the admissions to the sick report were about one fifth less.

Comparisons with the ratios of admissions and deaths for all the years of peace since 1839 will show a progressive and apparently permanent improvement in health.

Malarial fevers, which occupied the fourth place on the list for the previous year, were reduced to the fifth place, the number of cases per 1000 of strength falling from 147 to 120.

Enteric fevers, 76 cases, or 3 per 1000 of mean strength; deaths, 9, or about 12 per cent of the cases treated. The previous year, 156 cases.

Venereal Diseases, 55 cases per 1000, as against 65 the previous year.

Acute Infectious Diseases: Chicken-pox, 1; dengue, 57; diphtheria, 32—1 death; measles, 36; mumps, 50; scarlet-fever, 2—1 death; typhus-fever, 1, and of other cases, 9.

Season of Greatest Mortality.—The month showing the greatest number of deaths to cases treated was August, when the rate rose to 7 per 1000; next, December, 6.5 per 1000.

In April the rate dropped to 3.3 per 1000. The average for the year being 5.5 per 1000.

Health of Geographical Divisions.—"Grouping such stations as are situated on the sea-coast and lakes, we find that diseases of the respiratory organs and those of the heart and its valves had a higher rate of occurrence than in either the river regions or the region of mountain and plateau. On the other hand, there was a decidedly lower rate of occurrence for diarrhœal diseases, for typho-malarial-fever, and for the malarial-fevers.

"Comparing rates in the coast regions with those of the previous year, it is shown that while there has been a slight increase of admissions for diarrhœal diseases, for most other diseases except pneumonia there was a lowering of the rates.

"In the river regions the admission rates have been less for all important disorders than they were during the previous year, pneumonia and diarrhœal diseases being excepted, while a decided decline was shown in rates for enteric and typho-malarial fevers.

"In the mountain and plateau regions there was a slight increase of diarrhœal diseases and pulmonary phthisis over the preceding year; in all other respects, however, there was lowering of admission rates for all diseases noted."

An abstract of special reports on the sanitary conditions of the posts and cases of diseases or injury of remarkable interest is appended, of much interest to both sanitarians and practitioners.

Compulsory Ventilation.—An important prosecution under the Public Health act has taken place at Bolton, England. A landlord was summoned under the act for not causing premises of which he is the owner to be properly ventilated. It was found that the upper sashes of the windows of houses on his property were immovable, and that the air within the tenements, on the occasion of the visit of the sanitary officers, was foul from want of ventilation. An order was made by the court that the windows be altered, so as to afford sufficient ventilation, within three days, under a penalty of $5 per day for non-compliance.—*C. W. Chancellor, M.D., in Maryland Medical Journal.*

EDUCATION OF THE RACES.

"COEDUCATION OF THE RACES," is the subject of a particularly interesting paper read by the Hon. Charles S. Young, of Nevada, and discussed by the leading spirits of practical education in the United States.* The author of the paper does not advocate the commingling of races in the same schools, as one might infer from its title, but the importance of more liberal educational advantages for the different races, particularly the Chinese and Indians on the Pacific Coast, specially adapted to their different aptitudes as compared with the Caucasian race.

"If education is the bulwark of American liberty," Mr. Young remarks, "then all the races within our borders should be fortified with such an education as that behind which they can serve their country best. Great as may seem the emancipation of a race from servitude, incomparably greater is the emancipation of a race from ignorance. Let there be obliterated from among the races all that caste which now comes from illiteracy, then the nation will develop unity in its variety, strength out of its weakness, a coeducation as broad as the universe.

"Of the 264,369 Indians reported in 1885 in the United States, 55,000 are of school age, 43,000 of whom are in tribal relations, and 12,000 in the Five Nations of the Indian Territory. Driven from one hunting-ground to another, most of this quarter million of Indians are west of the Mississippi River. These live chiefly on Government reservations, or in hovels and tents around the towns and villages. Simple in habits, savage in propensities, their transformation from their ruder to our more polite living is slow indeed. Exclusive of the few children in school, their education is incidental, not special. From more or less constant association with them, from a personal inspection of the reservation school at Pyramid Lake, from many evidences of their handiwork seen at various

* Circular of Information of the Bureau of Education, No. 2, 1886. Proceedings of the Department of Superintendence of the National Educational Association at its Meeting in Washington, February 23–26, 1886.

times, I am convinced that the desire and capacity of the Indian youth to learn the rudiments of education are something amazing. Further than the rudiments they seem limited in capacity. The Department of Indian Affairs, in a letter addressed to me a few weeks ago, asked why these Indian youth might not be educated in the public school. The answer is, While the law does not exclude them, nor yet any general sentiment of prejudice, still they are not found in the public school ; the whites do not exclude them ; they are excluded by their own mental peculiarities. Of the 13,000 Indians in California, only 192 attend the public school ; of the 5000 Indians in Oregon, 50 are in the public school ; of the 9000 Indians in Nevada, I know of but one now attending the public school. It is officially stated that about thirty-three per cent of the Indian youth of the United States are enrolled in schools of some kind. This may be true as to other sections, but in Nevada there is an enrollment of less than ten per cent of the Indian youth. It is now generally admitted that the children of the aborigines require special schools—industrial schools, such as are at Carlisle, Hampton, Forest Grove, and Albuquerque, yet not one child of the many thousands in that part of the United States where I live has ever enjoyed the privileges of one of these schools. Congressman Woodburn, however, has just introduced into the House a bill which provides for the erection, at Carson City, of a building for one of these national industrial schools. In justice to the thousands of domesticated Indians of that section, this bill should certainly become a law.

"Of the Mongolian race there are but few Japanese. This element as yet is so small a factor in our educating influences that I shall pass it over without special comment. There are at least 150,000 Chinese on the Pacific Coast. Few of these are children. This is explained by the fact that the Chinese influx is chiefly males, the number of males to females being as is twenty-five to one. The domestic relation, the home, is an institution wholly unknown to the Chinese serf of this country. . . .

"It is patent to all that the Chinese have not received an American education. Mentally, morally, socially, in no respect do the Chinese bear the slightest resemblance to those

who hold within their grasp the destinies of this nation. But whatever may be said of their unfitness to become citizens, the Chinese youth who are natives of the soil will grow into citizenship. The Chinese youth, then, should be educated. If there be no better reason than a national pride, this alone would demand that at least this much be done for the youth of this race. Education is the foundation as well as the superstructure of this Republic. 'Educate, educate, we must educate,' applies with like force to the Hawaiian, the Indian, the Negro, the Chinese, to every possible element that may become a factor in our nation's career.

"In nearly all, if not in all, of the Western States, it is conceded that all Chinese youth born in the United States, and of school age, have the same rights as are guaranteed to the youth of the most privileged classes. Recently the courts of California so decided. In conformity with this decision the school directors of San Francisco have rented a building where by themselves the Chinese youth may attend school. Of the 1000 of these youth in that city a few weeks since, I found in my visit to this school but twenty-one pupils. The latest official returns from the office of the superintendent of public instruction give but twenty-five as the number of Chinese youth in the public schools of the whole State. Although Oregon has a Chinese population of 10,000, Superintendent McElroy says he has never seen a Chinese child in school, nor has he ever heard of one being in a school under his supervision. At present there is not one Chinese child either in the public schools of Arizona or Nevada. Including those in the schools of the various missionary societies, I think there is not an enrollment of five per cent of the whole number of Chinese youth of school age.

"In explanation of why the Chinese and Americans do not intermingle socially and educationally, it is sometimes asserted that it is cultivated prejudice, that it is the work of the demagogue. Not so; it is human nature, pure and simple. The demagogue who from the pulpit or the platform tells his hearers but half the truth, or deludes them into believing what are not facts, remains usually two thousand miles distant from where the facts are exposed to the view of every observer. The theorist may theorize, the moralist may moralize, but the

matter-of-fact American will not become the associate of the Chinese serf. If the latter be a stench in the nostrils of our civilization, much more fatal is his companionship with the Caucasian child, whose character should be permitted to develop in none other than an atmosphere of high moral influences.

"It may be that all race lines ultimately will disappear under the moulding influences of our progressive education. It may be that, some time, ours will be purely an American civilization. It may be that, centuries hence, the Caucasian, the Negro, the Chinese, the Malay, and the Indian of this country will be one people, whose origin with respect to race is forgotten. Then in the same class-room the children of the various races will study the same text-book; before the same altar the races will worship the same God; before the altar of a common country the united millions will present a common offering. But the eyes of the practical present see in America no such millennium for the brotherhood of man. Could I take you as often as I have taken Eastern friends through the cellars, cesspools and opium dens of Chinatown in our metropolis, the scenes there presented would be to you argument conclusive that under the same roof and within the same walls a forced coeducation of these worshippers of heathen gods and the descendants of our Pilgrim Fathers would be a national disgrace.

"The cosmopolitan character of the Western communities is not well understood. Frequently I have seen within a radius of three miles the representatives of every flag, and the exclusive settlements of three distinct races, the Caucasian, the Chinese, and the American Indian. While in the realm of matter these races are close together, in the realm of thought they are centuries apart. The difference in the habits and inherited proclivities of these races is evidence that they require a special education. An education practical for one race might be of no practical value to another race. A knowledge of the science of agriculture, grazing, and the various kinds of handiwork, would be useful to the Indian, but a knowledge of the classics, civil engineering, and the fine arts could be of no possible use to him. A knowledge of English literature, architecture, or jurisprudence could serve a Chinaman little purpose, while by his knowledge of garden-making, laundry-work, or cooking he derives his subsistence. An intelligent father, in

selecting the kind of education required for his sons, consults the various tastes displayed. He sends one to a school of agriculture, another to a school of theology, another to a school of technology, and another to a school of the classics. The nation has no right to be less discriminating, or not to discriminate at all, as it now does, when providing educational facilities for its different races. If Wendell Phillips, Gail Hamilton, Charles Francis Adams, Jr., and others can with reason offer adverse criticism on the practical results obtained from our American school system arranged for children of like heritage and like tastes, still more emphatic becomes the criticism when applied to a school system for children whose tastes are as dissimilar as is an Indian village from an American city, or as is the Empire of China from the Republic of America. As in a factory of matter-development each person learns a trade to which he is especially adapted, so in this great national factory of mind-development each race, as much as practicable, should learn those things which nature intended it should learn, and in the doing of which it may require the greatest possible skill. Then will be produced in our nation an intellectuality in texture firm, in kind varied, in utility greatest."

In the same vein is the excellent address on the "Educational and Religious Interests of the Colored People of the South," by the Hon. S. M. Finger, of North Carolina, from a standpoint which has made him thoroughly familiar with his subject. Although the negro is as "a citizen equal before the law to any other citizen in all the States of this Union," his race distinctions are none the less prominent in all of his relations, and the thought of educating him and improving his religious status without a practical recognition of his race distinctions, is indulged by those only who have had very limited opportunities of understanding his natural propensities and capabilities. "The colored people can never be made to stand alone unless they are encouraged to depend upon their own efforts and resources. Mixed churches and mixed schools inevitably take away the occupation of colored teachers and colored preachers. . . .

"The white people of the South insist rigidly upon but two things as to intercourse between the races: (1) That there shall be separate public schools for both races, and (2) that there

shall be no intermarriage between the races. The negroes, or, rather, the too sanguine friends of the negroes, who do not know them, will act wisely if they will make no contest on these two points. These are matters of public policy which the States have a right to control, and about which there is almost unanimity of sentiment. . . .

"In some sections of the South strong efforts have been made to establish mixed congregations for public worship, and the colored people have been invited and even urged to join the white congregations, but they almost invariably refuse to do it as long as there is a colored congregation in the neighborhood. I see it stated that quite recently the Florida Conference of the Methodist Episcopal Church North divided on the color line, forming two conferences in the same territory, one white and one colored. In making this division it was argued that this step had become a necessity for the progress of this church in the South. Thus slowly is the truth dawning upon men's minds that these races are so different in nature and habits that they are not now suited for such associations.

"The colored people really prefer to have their schools and churches separate from those of the whites, and the whites demand that their schools and churches shall be separate from those of the colored people.

"This disposition of the races to separate from each other is explained by those who advocate mixed schools and mixed churches by saying that at the bottom of the whole matter is race prejudice. Those who advocate separation say that this disposition rests upon legitimate social instincts, and not upon race prejudice. Whatever is the true explanation, the fact is hardly disputed by any intelligent person, and as a fact it must govern our policy.

"The most intelligent of the colored people know that the policy of mixed schools would inevitably break down the whole public-school system of the South, and so deprive them of the educational opportunities which they now have at public expense. They know, too, that a policy of mixed schools means that white teachers, and not colored ones, would be employed, if such a policy could be adopted without breaking down the schools entirely. They know, too, that mixed churches mean white ministers and not colored ones.

"If the colored people are to make progress they must, as far as practicable, be thrown upon their own efforts, educationally and religiously, as well as in a material point of view. In these particulars the same rule applies as in the whole animal and vegetable economy—effort and exercise.

"But the colored people must be encouraged in every practicable way to help themselves. Just as a child, when being taught to walk, does not learn to walk, no matter how much its mother may help it, until it puts forth its own powers and tries to help itself; just so must the colored people, weak as they are, be led by the whites, but in such way as to cause them to try—cause them to call into exercise all their powers. In accordance with this principle, I think it best for them to have teachers and preachers of their own color so long as they may want them.

"By pursuing this course the two races can, I believe, live in the South together in peace, each helping the other; and there will be some field of intellectual work open to the negro. In this country, where there are seven whites to one negro with such a wide difference between them in every way, it is not reasonable to suppose that there can ever be any considerable field for intellectual work for the negro unless he finds it among his own people. Without some opportunity to exercise his intellectual faculties he will soon be discouraged, and lose his appetite for education, and become a mere serf or peon. Already there are signs of discouragement. As the negroes realize that labor is a necessity, and that education does not free them from it, they relax their efforts and are not so anxious to send their children to school; and under any system that it will be practicable to adopt, we will see more and more of this as time rolls along. They, however, have a commendable race pride. They have always been dependent upon the whites, and the whites have always claimed that this dependence was natural and necessary for the welfare of both races, and have always claimed superiority. In more ways than one, since the war, the negroes have been taught that they are not naturally inferior to the whites, and that all they lack of being equal to the whites is education and a proper sense of self-dependence, or rather independence. Even if this is not so, their believing it stimulates their race pride and

makes them struggle harder to advance. This is very much to their advantage, upon the principle, universally acknowledged, that a faithful trial is half the battle, in every enterprise and with all people. I think, therefore, that so long as the negroes prefer teachers and preachers of their own race, they ought to be encouraged in their preference, provided colored persons will qualify themselves for the work; but there must be a rigid superintendence of all school work by the whites.

"While education in books, especially in the fundamental branches of English, is, perhaps, of prime importance, industrial education is of scarcely less importance, and it is pressing for proper recognition in our systems. How and to what extent it can be applied for the benefit of the negroes I cannot now discuss, more than to say that it is most highly probable that an unusually large proportion of them will always find their places on the farms, and that therefore special efforts ought to be made to teach them the most improved methods of farming. Farm life is itself a very fine industrial school, and as the general farming interests of the South are improved the negroes will share largely in the benefits."

DISPOSAL OF THE DEAD.

REPORT OF THE COMMITTEE ON THE DISPOSAL OF THE DEAD, AMERICAN PUBLIC HEALTH ASSOCIATION.*

By JOHN MORRIS, M.D., Baltimore, Md., Chairman of the Committee.

THE Committee on the Disposal of the Dead beg leave to report that since the last meeting of the Association very few facts bearing on the subject have been brought to their attention, either from sanitary reports or the medical literature of the year.

It is only in the case of sudden and violent irruptions of disease or a great epidemic that the failure of the ordinary modes of burial can be realized or properly brought to the notice of the people. During the past year no such outbreaks have occurred, and the consequence is that no attention has

* Read before the American Public Health Association, Toronto, October 8, 1886.

been given especially to the matter. The constitution of the human mind is such that it is not prepared or willing to foresee or guard against danger ; it hopes, it waits with an indifference worthy of fatalism. A slight earthquake at Charleston will do more to make strong walls by the use of good lime than all the teachings and warnings of architects and builders ; and so it will be with the question of the disposal of the dead. Some sudden and unlooked-for calamity will come upon the land, and then the people and the medical profession as well, now so hopeful or so incredulous, will be roused to the necessity of some radical measures not only to correct present evils, but to protect all who come after us. The strong argument employed by those who do not deny the possibility of danger is that there is no immediate, no pressing need for reform ; that our country is not yet overcrowded, and that we may safely wait for the approach of danger. This is not a wise or a humane argument. Posterity, as has been humorously said, has done nothing for us, but one of the reasons of our being here is to prepare the way for those who are to follow us, plan all things for their safety, and to make the earth a pleasant abiding-place.

Notwithstanding the apathy to which we have alluded, the subject has not been entirely neglected. A report was made at the meeting of the American Medical Association at St. Louis, in May last, favoring cremation, and a resolution introduced embodying the sentiments of the report. The temper of the Convention was evidently in favor of cremation ; but the absence of any pressing need and the wisdom of longer delay before adopting so radical a measure were urged and finally accepted. A special committee, however, was appointed to still further investigate the subject and report at the meeting next year.

The question of burial reform is attracting more attention in England at this time than in any other country. The London *Lancet*, while it claims the first place for burial among the various methods which have been adopted for the disposal of the dead, admits the need of reform in our present customs of interment. It acknowledges traditional errors in this respect and argues for greater simplicity. It says : " We are made of the earth, and we but follow the laws of all created forms when our bodies are finally restored to the earth ; but,

if we maintain this rule, the stout case in which we are wont to inclose the dead, and fruitlessly to forbid decay, must be abandoned. To retain its use is a blot upon our civilization. We corrupt nature while we profess to copy her, and we store up for ourselves under our very feet the accumulated and postponed decay of many years. The more perishable the covering the better for our purpose and the better for the health of the community." The Church of England Funeral Reform Association, to which we referred in our report of last year, is pursuing its labors in the same line. This Association is composed of the leading gentlemen of England. At a late meeting the Bishop of London and the Duke of Westminster agreed in recommending to all classes, especially to the wealthy, the duty of asserting by example the need of reform in our mode of burial. It is by organizations of this kind, composed of the wealthy and intellectual classes, that we may expect to influence public opinion and finally bring about improvements.

The "earth-to-earth" system advocated by Mr. Seymour Haden, the details of which were given in our previous report, is the favorite mode adopted by these modern advocates of burial reform. Mr. Frederick W. Lowndes, of Liverpool, who has witnessed in the last seventeen years the removal of five burial-grounds, and the exhumation of hundreds of bodies therefrom, as well as of others for medico-legal purposes, is a strong advocate of the "earth-to-earth" system. He says: "Admitting, which I freely do, all the advantages of cremation, I see many objections to and difficulties in the way of its general adoption. Hence it appears to me wiser that we should concentrate all our efforts in improving the present mode of burial."

In three cases of poisoning by arsenic, in which the deceased were just above the level of paupers and had been buried in common graves, the coffins, all of pine deal, were intact after ten months, fifteen months, and even three and a quarter years' burial. I have seen in a damp soil coffin boards preserved after thirty or forty years' burial. These facts of the past ought to guide us in our regulations for the future. The leaden coffins, with vault or bricked grave burials, are slowly becoming things of the past. But the wooden coffins still used are too massive and heavy, as well as much too imperish-

able. It is evident that even pine deal, which is said to be the most perishable of all woods, is not perishable enough. It is therefore unsuitable, and some other material is desirable. Sir Spencer Wells, writing on the same subject, says: "In this metropolitan district, in the twenty-five years 1859 to 1883, the deaths registered number 1,896,314. Of course the dead have been buried, and, with scarcely an exception, in and around London. Grant that in ten years a body may become harmless—although I do not at all believe that it does so within twenty years in our soil and climate—can any imagination conceive the enormous mass of decaying animal matter by which we are surrounded? Could any one be surprised at the outbreak of some devastating pestilence a hundredfold more destructive than the plague or black death of the Middle Ages?"

The sanitary and judicial aspects of cremation were thoroughly discussed in the Academy of Medicine of Ireland in April last. Dr. Tweedy read a paper on the subject. He alluded to the condition of graveyards which gave rise to the Southwood Smith Commission in 1849, and proceeded to show that the dangers arising from the present mode of sepulture were to be traced partly to the contamination of air and water by the gases of decomposition and other putrefactive matter, and partly by the fact that the germs of zymotic diseases not only retained their vitality in graves, but are capable of indefinite propagation under favoring conditions of heat and moisture. The Registrar-General for Ireland (Dr. Grimshaw) said the question of cremation was one of great and growing importance. Its sanitary aspect admitted of no discussion, and its sentimental aspect scarcely concerned the medical profession; but its medico-legal aspect required careful consideration in the interests of the public, having regard to the risk of cremation being made use of as a readier method than others to get rid of suspicious cases. Dr. Athill had long been in favor of cremation, and regretted that the good old system of ancient times was not still carried out. Dr. Henry Kennedy said the question of expense was worthy of consideration in connection with the subject, as the cremation of paupers would be a considerable tax on the country. He did not believe in the great danger to health alleged to arise from interment. There was no evidence that graveyards were a source of sick-

ness, and, therefore, it might fairly be questioned that the mischief alleged to arise from such contamination was exaggerated. Dr. John William Moore regarded the argument from sentiment as altogether in favor of cremation. In the Bible there was nothing from beginning to end opposed to cremation. Dr. Henry Kennedy had not given sanitary or preventive medicine sufficient credit, nor could he agree with him as to the comparative innocuousness of the round of nature which he had described. The President (Dr. Jacob) held, with the Registrar-General, that the sanitary aspect of the question was not open to dispute. Indeed, any system by which the results of decomposition could be got rid of would be a boon. Dr. Tweedy's paper had satisfied him that the medico-legal difficulties in the way of cremation had been thoroughly met. It was only in one of twenty thousand cases that judicial considerations intervened and a suspicion arose to justify exhumation, and, therefore, as regards cremation, they had to deal but with that one case in which the law found it necessary to protect the public against foul play.

Another reform in modes of burial has been suggested by Colonel T. Martin, formerly sanitary commissioner in Bombay and Scinde. Colonel Martin advocates cremation in certain conditions, but prefers, for reasons of his own, to preserve the practice of burial, subject to great changes in the method. He does not advise the "earth-to-earth" system and the use of perishable coffins. He recommends air-tight and durable coffins fitted with valves to open underground. He suggests the plan of subterranean ventilating tubes with shafts rising high above the ground to carry off the putrid gases, the purpose of the whole arrangement being to permit spontaneous decomposition without the body coming in contact with the earth. For seaport towns he has devised a somewhat similar plan, the coffins being made impervious and thrown into the sea. Colonel Martin does not like the "earth-to-earth" system for the reason, he says, that the absorption of decaying matter by the soil contaminates the neighboring springs, and because he believes that there is greater danger of contagion if bodies are buried in lightly-made cases instead of close coffins.

We do not think Colonel Martin's original and ingenious system will meet with much favor. It is entirely too expen-

sive and complex. It, however, forms a part of the literature of the subject for the year.

The most notable event of the time in connection with the disposal of the dead has been the action of the Roman Inquisition, which, by a decree dated May 19th, 1886, has forbidden Catholics to join cremation societies or to have their bodies cremated after death. This decree has been confirmed by the Pope.

How far this action of the Vatican will influence public opinion on this subject is yet to be determined. The Church claims control over the body not only during life, but after death. The State may at a future time determine that "earth-to-earth" burial is detrimental to the public safety, and thus a conflict as to the things which are Cæsar's may arise. Such a conflict would be most unseemly and much to be deplored. Notwithstanding the disapproval of the Church, a Congress of those favoring cremation in Italy and Germany is to meet during the present month. The suggestion made in the report of last year that the bodies of all persons dying from zymotic diseases should be cremated might, in obedience to public opinion, be modified so as only to compel by municipal or State law the use of destructive agents to bring about the rapid disintegration of the dead body. Caustic, lime, or chloride of zinc are agents that could be properly employed for this purpose. The very general belief in the germ theory which prevails on all sides would render a compulsory law of this character acceptable to the people. Those sanitarians who are not prepared to accept the more radical process of cremation by fire might, with great consistency, indorse this slower but equally potent form of destruction. A law of this character is particularly desirable in large cities. Children dying from diphtheria and scarlet-fever are frequently kept in public vaults for a year or more before burial. A recent examination of a church in England, that of St. Mary Woolnoth, will illustrate the danger of this practice. Complaints had been made for a long time of bad smells which prevailed in the building. On examination, hundreds of bodies undergoing decomposition were found underneath the floor. The last of these was buried, or, rather, entombed, many years ago, but from the conditions of interment they, with their massive coffins, are still decaying, and are thus at this late day yield-

ing to the congregations worshipping in the church the gases of putrefaction.

Burials in vaults should be absolutely forbidden by legal enactment. The burial of persons dying by zymotic diseases should also be placed by law in the hands of the health authorities, and not left to the whims or caprice of families. This suggestion, made in our former report, we deem a vital one, and we shall reiterate it constantly until it meets with final acceptance. The vanity of the living must give way to the safety of the living, and the sooner science, philosophy, and religion adopt this view the better for mankind.

In conclusion, your committee respectfully urge the continuance of this work in other and newer hands. The experience and developments of each year add to our knowledge of the subject, and if a committee is in existence its members will watch faithfully all passing events that may serve to furnish details and facts to instruct and guide the people, who, without a guide, are blind on all subjects of sanitation.

THE CHEMICAL COMPOSITION OF MAN.—From a chemical point of view, man is composed of thirteen elements, of which five are gases and eight are solids. If we consider the chemical composition of a man of the average weight of 154 pounds, we will find that he is composed in large part of *oxygen*, which is in a state of extreme compression. In fact, a man weighing 154 pounds contains ninety-seven pounds of oxygen, the volume of which, at ordinary temperature, would exceed 980 cubic feet. The *hydrogen* is much less in quantity, there being less than fifteen pounds, but which, in a free state, would occupy a volume of 2800 cubic feet. The three other gases are *nitrogen*, nearly four pounds; *chlorine*, about twenty-six ounces, and *fluorine*, three and a quarter ounces. Of the solids, *carbon* stands at the head of the metalloids, there being forty-eight pounds. Next comes *phosphorus*, twenty-six ounces, and *sulphur*, three and a quarter ounces. The most abundant metal is *calcium*, more than three pounds; next *potassium*, two and a half ounces; *sodium*, two and a quarter ounces; and, lastly, *iron*, one and a quarter ounces. It is needless to say that the various combinations made by these thirteen elements are almost innumerable.—*Le Practicien.*

THE SANITATION OF LONDON HOUSES.

MR. DIXON-HARTLAND'S bill proposing a new Sanitary Board for London, now before Parliament, provides, in effect, for the compulsory sanitary inspection and registration of all buildings of whatever nature. The metropolis is, according to the scheme, to be divided into seventy districts, each of which is to be "under the control" of a sanitary surveyor. On giving a week's notice this officer and his assistants—the present sanitary inspectors—may enter a building and inspect all sanitary appliances, fittings, and drains; and should he find the building not in a sanitary condition he will point out the defects, and require them to be amended within three months. But should the building be found to be in a sanitary condition the surveyor will, if desired, certify this for a fee of a guinea. And without such a certificate no house is in future to be let. Apparently, however, the certificate would be valid for this purpose for as many as six years. A further provision is that no sanitary work is to be commenced until the plans have been approved by the surveyor; nor is any drainage work to be covered up until it has been examined, tested, and passed by him. As to new buildings, none are to be begun until complete plans of the drainage have been deposited with the sanitary surveyor of the district. These plans, and also copies of sanitary certificates, are to be accessible to the public at his office on payment of a fee of one shilling.

The author of the bill, having his own notion as to a perfect system of drainage, embodies it in all its numerous details in the bill, and insists on its being observed in carrying out the work under the measure.

As to water, it would unquestionably be an advantage from a sanitary point of view, if, where the supply is constant, that used for drinking purposes were always, as is here directed, drawn from the main, and where it is intermittent a cistern provided for drinking water alone; and if in all cases the wastes and overflows of cisterns were discharged into the open air. Nor would any one complain if his neighbors' dust-bins were limited to the smallest capacity in proportion to the size

of the house, and were prohibited from containing more than a week's refuse and from being constructed of any but non-absorbent material. It seems, too, a very wholesome provision that all existing cesspools should be destroyed, and also all disused sewers or drains running under buildings intended for occupation. But it would probably be a formidable undertaking to have all pan closets, lead "D" traps, and bell-traps removed, and also all copper closets except those of a pattern approved by the Board.

Desirable as much of the work proposed by the bill undoubtedly is, the cost is a most material consideration. This, it is vaguely directed in the bill, is to be borne by the owners, "having regard to their respective interests in the house in possession, reversionary, or otherwise." But the expression "owners" is not to extend to occupiers holding a three-years' agreement or to yearly tenants. In the event of dispute arising as to the apportionment of the cost—a very likely event in most cases—it is to be settled by two sanitary surveyors and an umpire. So far as we can see, the requirements of the bill, which is drawn somewhat obscurely, are so numerous that there are but few houses where the owner or occupier, or both, would not be at once exposed to incalculable worry and expense at the hands of the surveyor under whose "control" his district would be.

The Sanitary Board which it is proposed to create for the purpose of directing all this work would consist of twelve members, to be selected from the Sanitary Institute of Great Britain, the Royal Institute of British Architects, and the Association of Municipal and Sanitary Engineers and Surveyors. It is not, however, stated how or by whom the members are to be selected. The duties assigned to the Board are to examine and appoint candidates for the office of sanitary surveyor and to grant certificates of competency. Moreover, they are to define the duties of the sanitary surveyors and inspectors and to form a court of appeal between these officers and the public. No sanitary appliances or fittings are to be used in any building unless the pattern has been approved by the Board. Further, the Board are to have "full authority over" the Local Board engineers and surveyors so far as relates to the drainage of houses. And where the sewers are

inadequate or improperly constructed or ventilated power is given to the Board to call upon the Local Board to remedy this. In fact, "all matters relating to the sanitation of houses" are placed by the bill "under the control and direction of the Sanitary Board;" but there is to be a right of appeal from them to the Local Government Board.—*London Times.*

SOME OBSERVATIONS ON LONGEVITY.

RECENT researches in various countries have brought to light some interesting facts relating to this subject. It appears that one third more women than men attain advanced age, this being due partly to their social condition and surroundings, and partly to their superior capacity of enduring pain, privation, etc. On the other hand, acute diseases are more fatal to males, both young and old, while many disorders, such as affections of the brain and liver, seem almost entirely confined to the latter sex. The proportion of those dying suddenly is about 100 women to 780 men. Statistics for the year 1870 show that of those who committed suicide 1080 were men and 285 women. Consumption attacks women oftener than men, the death-rate of the former being very much in excess. The birth-rate in foreign countries shows a larger proportion of females, especially among the higher classes and in the royal families. In the negro race, while the birth-rate about equals that of the whites, the deaths are greatly in excess, and a much smaller proportion reach advanced age. In these, such affections as Bright's disease, rheumatism, malarial-fever and cardiac trouble are doubly fatal, as well as much more frequent. There are, no doubt, abundant reasons to be adduced in explanation of these facts, but scientific research has not yet demonstrated them. Possibly the mere fact of sex and physical conformation has little to do with the question of longevity—the variation in the latter particular being attributable to physical conditions and surroundings, to which the male is everywhere more exposed. The evils of intemperance and brain exhaustion, which are confined almost exclusively to the latter sex, act as additional factors in curtailing life, as well as in the production of the

high comparative rate of suicides. There are at present no sufficient data by which the excess of one sex over the other can be accounted for, yet it is not improbable that high civilization, with its resulting conditions, may have some causative influence in this particular, as they certainly have upon the whole number of births. The geographical surroundings of a people have so much to do with their physical condition and characteristics that no universal rule as to longevity and productiveness can be formulated. The statistics of every country show variations of more or less importance, and conclusions, therefore, which have been reached by investigators must in the present instance be taken with a grain of allowance in the maintenance of life and health ; but these are hardly sufficient to offset the condition of impaired physical organization, to which may be added a constitutional taint intensified and rendered active by transmission through several generations. Says Herbert Spencer : "In its full sense, the reproductive power means the power to bear a well-developed infant and to supply that infant with the natural food for the natural period. Most of the flat-chested girls who survive their high-pressure education are unable to do this." So long as one or both parents are physically impaired in any way, their progeny will be subject to a like infirmity, and many young children will die and the race will deteriorate.—From *New England Medical Monthly.*

THE PROPER FOOD FOR CHILDREN—THE IMPORTANCE OF EXCLUDING MEAT.

By D. M. Camman, M.D., New York.

Are young children under seven or eight years old best reared on a diet composed largely of meat, or is the best result attained by giving largely of milk, vegetables, and the cereals, and reserving meat for a later period ? It may reasonably be supposed that the delicate mucous membrane of the child, and the temporary teeth, which are called milk teeth, are best suited to the latter form of diet. It has been found, too, that the gastro-intestinal complaints so prevalent with

children, especially in the summer, are infrequent in those from whose dietary meat has been omitted, and who are fed largely on milk. Dr. Clonston (*Practitioner*, 1881, p. 221), after saying that he agrees with Dr. Keith, who has preached an anti-flesh crusade in the bringing up of all children up to eight or ten years old, continues, "I believe that by a proper diet and regimen, more than in any other way, we can fight against and counteract inherited neurotic tendencies in children, and tide them safely over the periods of puberty and adolescence."

A few facts are worth more than any *a priori* reasoning. These may be gleaned from the experience gained in the use of the following dietary of the Orphans' Home and Asylum of New York, which has been used without any material change for the past twenty-seven years. During this time the rarity of disturbances of the digestive organs has been remarkable, and the recovery of the children suffering from other diseases, such as scarlet-fever, has been exceptionally rapid. Especially would it seem that this diet was suitable for those who show any tendency to disturbances of the nervous system, either inherited or acquired. The death-rate in the institution has been extremely low. The number of children is about 145. Children are not admitted under three years of age. Those over eight years old have meat three or four times a week with their dinner, and at those meals milk is omitted; otherwise the dietary is the same as for the younger children. —*From the Journal of Reconstructives.*

The Small Boy who Ate Sorrel.—It was a very curious and almost unprecedented chain of causes, we imagine, which brought about the death of a little boy at Birmingham the other day. The poor child ate during the day a quantity of sorrel which he found near his mother's house. In the night, feeling thirsty, he drank freely of some soapy water which stood near his bedside. Next day he died, and an inquest being held, the medical evidence was to the effect that the alkali of the soap acting upon the sorrel had formed oxalic acid, a poisonous compound by which the child had been killed.—*London Globe.*

DRUGGED BEER.

BROOKLYN, March 9, 1887.

Dr. A. Otterson, Commissioner :

DEAR SIR : During the year 1885 I had the honor to call the attention of the Department to certain abuses in the manufacture of lager beer, so-called, in the course of which I said that "the most important adulterations discovered, from a sanitary point of view, were yeast and sodium bicarbonate." Since that time I have from time to time inspected the breweries of the city. As this beverage has become so largely used by families, it is now kept in bottles by many grocers. All brewers are compelled to manufacture an article for the use of bottlers. This is prepared with more care, in most cases, on account of the longer time it is to be kept before using. Unless it be thoroughly cured and well cleared the beer will often spoil before it is consumed by a process of fermentation or putrefaction. To avoid the necessary care in the manufacture and the keeping of the beer for a longer time, it has become a practice among brewers to add salicylic acid to prevent this fermentation after the beer is sent out. I have for some time been aware of this use of salicylic acid, as well as its addition to wines, canned fruits, cider, milk, and other goods for the purpose of preserving them from fermentation. In fact, the use of this acid is coming into such general use in foods that it is becoming an important sanitary question as to its effect upon health when used in small quantities for a long time. There can be no doubt that in large quantities it acts very injuriously both upon the digestive processes and the kidneys. In its elimination the kidneys not rarely become acutely congested or even inflamed, giving rise to acute Bright's disease. Although a potent remedy in the treatment of acute rheumatism, it is not suitable for long administration, owing to the above injurious action. It requires the addition of from eight to ten grains of free salicylic acid to

one gallon of beer in order to prevent the growth of ferments. If bicarbonate of soda has also been added the quantity of acid necessary to be added is much more. Three grains have recently been found to each pint of wine. Assuming that the smallest effective proportion of the acid is used, viz., ten grains to the gallon, there are many persons in this city who take no inconsiderable amount of this drug every day of their adult lives. The salicylic acid of the market is prepared from carbolic acid, and is frequently contaminated with a small proportion of this very poisonous agent. This is a well-known fact to all pharmacists. The sanitary question, then, rests upon the question of the action of small and long-continued doses of salicylic acid, possibly contaminated with carbolic acid.

Upon this point I think it necessary to quote here but one of many authorities. In 1881 and again in 1883, upon the recommendation of the Central Committee of Hygiene, the French Government prohibited the sale of articles of food containing salicylic acid. As protests were made against this legislation, and as these protests had led to contradictory judicial decisions, the above committee requested the opinion of the French Academy of Medicine. A commission created by that body of savants has recently made a report (*Bulletin de l'Acad. de Med.*, Paris, 1886, T. XVI., pp. 583 *et seq.*), from which the following is an extract : " While in persons of good health the prolonged use of such small quantities of salicylic acid as would be contained in articles of food or drink treated with this substance is probably not injurious to health, it may nevertheless produce very decided disorders of health in certain persons, and especially in the aged and in those who have a tendency to diseased kidneys or dyspepsia. Salicylic acid and its salts are eliminated by the kidneys. They tend somewhat to check the action of the digestive ferments contained in the saliva, enteric juice, and pancreatic fluid, and hence to delay digestion ; hence, it is easy to understand that they may aggravate digestive or renal troubles."

The report closes with the recommendation that the addition of salicylic acid or its compounds, even in small amounts, to articles of food or drink shall be absolutely prohibited by law. This commission found by their investigation that the

quantities added to wine were about 6 grains to the gallon, and to beer from 12 to 15 grains.

From the facts here stated I am of the opinion that it is time that the addition of salicylic acid to articles of food received a check at the hands of sanitary authorities. I have made examinations of several different kinds of bottled beers manufactured and sold in this city, and have found a number of them to contain salicylic acid. The list examined contained some of the Western beers, which were also found to contain it. I would respectfully recommend that some action be taken by this department toward the prohibition of this injurious adulteration.

E. H. BARTLEY, M.D.,

Chief Chemist of the Health Department of Brooklyn, N. Y.

TEST FOR ARSENIC IN WALL-PAPER.—A simple and easily applied test for arsenic in wall-paper has been devised by Mr. F. F. Grenstted. No apparatus is needed beyond an ordinary gas-jet, which is turned down to quite a pin-point, until the flame is wholly blue ; when this has been done, a strip of the paper suspected to contain arsenic is cut one sixteenth of an inch wide and an inch or two long. Directly the edge of this paper is brought into contact with the outer edge of the gas-flame a gray coloration, due to arsenic, will be seen in the same. The paper is burned a little, and the fumes that are given off will be found to have a strong garlic-like odor, due to the vapor of arsenic acid. Take the paper away from the flame and look at the charred end—the carbon will be colored a bronze-red ; this is copper reduced by the carbon ; being now away from the flame in a fine state of division, the copper is slightly oxidized by the air, and on placing the charred end a second time not too far into the flame, the flame will now be colored green by the copper. By this simple means it is possible to form an opinion without apparatus, and without leaving the room, as to whether any wall-paper contains arsenic, for copper arseniate is commonly used in coloring wall-papers. —*British Medical Journal, December 11th*, 1886.

SUBSTITUTION BY DRUGGISTS.

THERE was a time when there was no intermediary between the physician and his patient—when every doctor dispensed his own medicines. In cities and closely-settled communities this practice gradually became burdensome, and was relegated to a special class, the druggist or pharmacist ; but the old-time custom is still adhered to very largely among rural or country physicians.

When the "patent medicine man" made his appearance, this agent or intermediary of the physician, promptly assumed the same position toward the intruder, and united to his honorable calling of pharmacist the less honest but probably more profitable one of vender of nostrums. This anomaly would have adjusted itself in time, and, indeed, has already partially done so, but the druggist has been deflected from the straight and narrow path. Aiding a fraud, what more natural than that he should, in certain instances, become imbued with the spirit of fraud? Seeing the gullibility of the public, and knowing the profits accruing from the trade in nostrums, the less honest and more avaricious members of the guild were henceforth but ill-content with the comparatively meagre profits of their honorable and legitimate calling. The outgrowth of this spirit was the crying evil of substitution—the replacement of high-priced ingredients in prescriptions by others less costly and totally inefficacious. There is scarcely a physician in our cities and towns who has not, at some time, had good reason to complain of this evil.

Of late the rascally practice has taken a wider range, in a direction made possible by the legitimate advances of the art of pharmacy. We refer to substitution as applied to those products of chemical and pharmaceutical skill aided by abundant capital, known as "proprietary preparations"—preparations the nature and ingredients of which are made known to the medical profession, for whose use alone they are manufactured, and which are by no means to be classed or confounded with "patent medicines." Many of these proprietary medicines are of great value commercially, and as a result they are composed of the purest drugs, compounded with great skill.

A certain proportion of the medical profession (and some of them men of wide and honorable reputations) have found these preparations good and useful, and their exhibition attended by most satisfactory results; and hence have prescribed them largely, *not the least potent reason for this fact being the feeling of security against substitution induced by the careful and often costly methods of package adopted by the manufacturing chemists.* But as "love laughs at locksmiths," so laughs the substituting druggist at seals and wrappers of unique design, at signatures and brands; and the manufacturing chemist who spends thousands and hundreds of thousands of dollars in keeping up the standard of his preparations, finds himself suddenly accused of allowing them to deteriorate, or possibly of sophisticating them for greater gain.

Without referring to them by name, we may say that very recently a number of the great manufacturing houses have found themselves in this unpleasant position; and in every instance where investigation was possible, the fact was disclosed that the apparent deterioration was due to the dishonesty of the retail druggist or prescriptionist, who had substituted his own worthless compounds for those ordered by the physician.

Such substitution is not simply dishonest; it is felonious, and displays the same reckless disregard for life that marks the burglar or highwayman who is prepared to take a life if it stands in the way of his plunder. The man who does it does not simply filch a few cents from the pocket of his customer (frequently poor and needy), nor does he merely jeopardize the reputation of a physician, but he puts in peril the life of the customer who trusts him.

The honest members of an honorable profession, and fortunately they are largely in the majority—the reputable pharmacists—owe it to themselves to expose these vultures and drive them from the trade. In doing so they should have the aid and countenance of every physician. In the mean time, let every physician not content himself with shunning the shops of those whom he detects in the nefarious habit of substitution, but boldly denounce them, and warn his patients against carrying prescriptions to them. Concerted action of this sort will soon purge the trade of the offending members. —*St. Louis Medical and Surgical Journal, March,* 1887.

THE MEDALS, JETONS, AND TOKENS ILLUSTRATIVE OF SANITATION.

By Dr. Horatio R. Storer, Newport, R. I., Member American Public Health Association, American Medical Association, Massachusetts and Rhode Island Medical Societies; Honorary Member Canadian Medical Association, New Brunswick (Canada) Medical Society, Medical Society of Finland, etc.; Corresponding Member New York Medico-Legal Society; Member Newport Historical Society and late Curator of its Coins and Medals; Corresponding Member American Numismatic and Archæological Society.

It is not the fashion in this busy land to give much attention to matters of medical history, or to anything, indeed, pertaining to what may be called the æsthetics of one's profession. There are always, however, a respectable number, even of the most active and practical of busy physicians, who gladly follow the course of such an investigation, if without trouble to themselves. Thus they obtain a portion, even if not all, of the interest and pleasure of the research.

But few, unless themselves devoted to the fascinating pursuit, have any idea of the extent to which, for many ages, the chief matters of importance in the world's progress, and, indeed, the very persons who have taken prominent parts in its development, have been commemorated upon coins, medals, and jetons.* So true is this that numismatics, as a science, has been gradually becoming divisible into many groups or special departments. History, ancient and modern, sacred and secular, architecture, music, the drama, theology, law, warfare, and all others of the arts and professions, thus sharply define themselves. Among them, though not many seem aware of the fact, is medicine.

* "Jetons, or memorial pieces [*monnaies de souvenir*], while as trustworthy as books, are more attractive than they as historical evidence" (*Letterbode*, 1797, No. 194, cited by Kluyskens). Their antecedents in olden times were used in computation, thus resembling in their financial character the modern token, some of which have been employed as promissory issues, and others merely as business notifications; in both instances differing radically from the memorial jeton.

Having for several years devoted my leisure during a protracted convalescence from serious illness to most delightful labor in what, in this country at least, seems an almost as yet unentered field, Drs. William Lee, of Washington, D. C., and George J. Fisher, of Sing Sing, N. Y., having been apparently my only companions therein as collectors, it is now my desire to indicate to others who may have the taste, the means, the time to spare, or the need for mental relaxation, a direction in which, if they but choose, they will be sure to find similar recreation, satisfaction, and even—if it should be viewed in that light—pecuniary profit.

Medical numismatics, like the other groups that I have mentioned, are capable of being still further subdivided. In a recent paper in the *New England Medical Monthly* (November and December, 1886), I have endeavored to describe the medals, jetons, and tokens illustrative of the studies, obstetrics and gynæcology, that have chiefly occupied over thirty years of my own life. It has seemed to me that it would not be time wasted, in view of the attention that preventive medicine is now very justly receiving, if I attempted in similar manner to group together the medals, jetons, and tokens that have been struck to commemorate sanitary writers, measures, and events. As this is a task that, like my previous one, is wholly novel, there existing, so far as I am aware, nothing whatever, in any language, upon this special branch of medical numismatics, allowance must be made for the omissions that will be sure to be found by subsequent investigators. I shall be grateful for references to any piece that may have escaped me, and, indeed, for the address of collectors of "medicals" in whatever subdepartment. The present communication should be considered but as a "first list," which, if life and health be spared me, I shall hope at some future time to present to sanitarians in a more complete and permanent form.

The arrangement that I propose to follow in this elucidation of the numismatics of sanitation is to consider in turn the medals and tokens relating to

I. The General Subject; II. Water Supply; III. Bathing; IV. Mineral Springs; V. Drainage; VI. Sewerage; VII. Ventilation; VIII. Diet; IX. Famine; X. Epidemics;

XI. Military and Naval Hygiene ; XII. Climate ; XIII. Registration ; XIV. Life Insurance ; XV. Hospitals.

I. *Sanitation in General.*—When describing ancient obstetrical medals (*New England Medical Monthly*), I spoke not merely of those bearing Lvcina, Foecvnditas, Venvs Genitrix, and the Artemis polymamma or Ephesian Diana, but also of others, with Salvs and Apollo, and stated that these latter, of more general bearing, not merely chronicled the occurrence of disease or recovery therefrom, like those of Asklepios or Æscvlapivs, and Telesphorvs, but were frequently employed, like the medals of Hygeia and Valetvdo, in reference to topics and events preventive in their character. Instances of this will be given in the course of the present paper. The goddess Panaceia, whose temple was at Oropis, was, like her sister Hygeia, worshipped as the daughter of Æsculapius by either Minerva or Epio, the child of Hercules. She has often been confounded with Hygeia, just as were eventually the latter and the older Sabine deity, Salus.

I have endeavored to ascertain everything that has been published relative to the deities of health and healing in connection with ancient numismatics, but the list is very limited. Brief as it is, however, it may have its use as a slight contribution to special bibliography. The following are the titles, so far as yet found by me. But a portion of them were known to Lipsius, 1800 (Bibliotheca numaria usque ad finem seculi XVIII.), and Leitzmann, 1867 (Verzeichniss, etc., 1800 bis 1866).

Bose, Cl. Groseus de. "Dissertation sur le culte que les anciens ont rendu à la Déesse (de la) Santé ; on y a joint les médailles, etc., qui ont rapport à cette matière." Paris, 1705, 8°.

Bose, Cl. Groseus de. "Dissertatio de cultu quo Salutem deam prosecuti sunt veteres ; cui additi sunt numi, etc., idem argumentum spectantia." (The above Latinized.) In Woltereck, Christoph. "Electa rei numariæ." Hamburg, 1709, 4°. This is in my library.

Burckhard, J. H. "Commentatio de diis hominibusque servatoribus ex numis atque marmoribus vetustis." Helmstædt, 1737, 4°.

Ebelt, Carl Heinrich. "De Valetudine inter deas a paganâ gente relatâ." Plavia, 1751, 4°.

Major, Johann Daniel. "Serapis radiatus medicus Ægyptiorum deus." Kiel, 1685, 4°.

Musgrave, William. "Dissertatio de deâ Salute in quâ illius symbola, templa, statuæ, numi, inscriptiones exhibentur, illustrantur." Oxoniæ, 1716, 4°.

Schwarz, Christian Gottlieb. "Expositio veteris inscriptionis de Æsculapio et Hygeâ diis philanthropois." Altorf, 1725, 4°. This work has also been attributed to Dr. Ferdinand Jakob Baier, of Altorf, but as he was born in 1707 he could have been but eighteen years of age at the time of its publication, and is therefore quite unlikely to have been the author.

Seelen, Johann Heinrich von. "De Salute numos recentiores ad exemplum veterum ornante *Συμμικτα.*" In his "Selecta numaria." Rostock, 1731, 4°.

Weil, R. "Asklepios und Hygeia auf Münzen von Bizya." Berlin.

Wroth, Warwick. "Asklepios and the coins of Pergamon." *Numismatic Chronicle*, 1882, p. 1.

Wroth, Warwick. "Apollo with the Æsculapian staff." *Ibid.*, p. 301.

In addition to the above, Mr. John Evans has briefly described in the journal last quoted (New Series, vii., p. 1) a medallion of Antoninus Pius, bearing upon its reverse Apollo, with the device discussed by Rev. Mr. Wroth.

In more modern times the goddess Hygeia or her name merely has frequently been used upon medals in an allegorical sense. There are special instances of this, to which I shall hereafter allude. Others exist of a more general character, of which the following friendship medal, by Loos, of Berlin, is an example :

1. Obverse. Hygeia feeding the serpent. Legend : Gesundheit verlängere dein Leben (May Health prolong thy days). Reverse. Youthful pleasure, alated, placing a garland upon an altar. Legend : Und Freude verkurze die Zeit (And Joy shorten thy hours). Silver. Size, 24 (sixteenths of an inch), American scale. Snowden, a former director of the United States Mint, gravely describes the obverse as "Eve receiving the apple, and giving food to the serpent" !

Snowden. Miscellaneous Medals, in his "Medallic Memorials of Washington in United States Mint," p. 234, No. 6.

This is in the United States Mint Collection. It occasionally appears at sales : as of Frazer Collection, March 27th, 1879, No. 486 ; the Frossard forty-first, March 24th–25th, 1885, No. 428 ; and the Woodward sixty-ninth (Private), October 13th–18th, 1884, No. 3102.

Directly or indirectly, Hygeia or her synonyme Health has been employed upon their tokens by several empirics ; let us so far give credit to them for their good taste. Though these are but camp-followers, or worse, of the healing and preventive arts, they have to be considered in an enumeration like the present, to make it at all complete. Such are

2. Obverse. Bust to right. Inscription : Isaac—Svainson. Reverse. The Goddess of Health, with a botanical specimen and cooking apparatus. Legend : Hygeia preparing Velnos' Vegetable Syrup. In exergue, P(onthon)., the die-cutter. 18.

Neumann. "Beschreibung der bekanntesten Kupfermünzen," No. 23,305.

This London halfpenny token is excessively rare, only twelve specimens being known. The dies were destroyed in consequence of the error in spelling the name.

3. Obverse. Bust ; beneath which, T. R. Pinches. London. Inscription : James Morison, The Hygeist. Born 1770. Died 1840. Reverse. Inscription in seventeen lines ; above which, James Morison, The Hygeist. Upon margin, The. Great. Medical. Reformer. Tin.

Duisburg. "C. A. Rudolphi recentioris ævi numismata virorum de rebus medicis memoriam servantia," Suppl. I., 1863, p. 13.

It is in the collection of the British Museum.

4. Obverse. Bust to right. Upon shoulder, incised, J. Moore. Beneath, London. Inscription : Professor—Holloway. Reverse. Hygeia with patera and serpent. Beneath, J. M(oore). Inscription : Holloway's Pills and Ointment. On edge, 1857. Penny. Copper. 22. 34½ mill.

Neumann, No. 22,651.

Weyl. "Verzeichniss von Münzen und Denkmünzen (Australien, Asien, Afrika) der Jules Fonrobert'schen Sammlung," No. 295.

Duisburg, Suppl. I., 1863, p. ii.

This is in my collection. The Holloway series were struck for especial circulation in Australia.

5. Obverse and reverse similar to the last. Halfpenny. Copper. 18. 28½ mill.

Neumann, No. 22,652.

Fonrobert (Australien, etc.), No. 296.

This is in my collection.

6. Obverse and reverse similar to the two last, save upon the latter 1858. Penny. Copper. 22. 34½ mill.

Neumann, No. 22,649.

Fonrobert (Australien, etc.), No. 297.

This is in the Lee Collection and my own.

7. Obverse and reverse as the preceding. Halfpenny. Copper. 18. 28½ mill.

Neumann, No. 22,650.

Fonrobert (Australien, etc.), No. 298.

8. Obverse. Within united laurel boughs, Dr. Eady | 38 Dean | Street | Soho. Reverse. A phœnix, rising from flames. Legend : Health Restored. Copper. 13.

Neumann, No. 26,485.

This was struck at about 1820. It is in the Lee Collection and my own.

9. Obverse and reverse as the preceding, save that the address is 38.

This also is in the Lee Collection and my own.

Though with her sister Hygeia, her father Æsculapius, and her brother Telesphorus, the goddess Panaceia appears upon one of the medals to Charles Rogier, of Belgium, shortly to be described, the word panacea has in modern times ordinarily become vitiated into the sense of an universal specific ; as, for instance, in two of the varieties of the Dr. Stuart (Glasgow) token of 1840 (Neumann, Nos. 26,449–50), to which I incidentally referred when describing his obstetrical issues (*New England Medical Monthly*, December, 1886). Both the Lee Collection and my own possess an example of this.

The following, though it might seem purely medical, is not out of place among the medals of sanitation. I have as yet failed to find that it is other than of a general character, or, indeed, that it has been described at all.

10. Obverse. Bust of Æsculapius to left ; his staff before his face. Beneath, Döll F. Inscription : Asclepios der Heilende (Æsculapius, the Healer). Reverse. The three Parcæ

with their emblems; Æsculapius arresting the hand of Atropos, whose shears have fallen to the ground. Legend: Der Retter naht u(nd): wehrt der Parze Hand (The Deliverer comes, and stays the hand of Fate). Exergue; Dank für Hülfe | und | Rettung (Thanks for aid and preservation). Silver. 23.

This very beautiful medal is in my collection. It came from Holland, though the dies were cut by Döll, of Carlsruhe.

There is still another device to be met with upon medals, which relates as distinctly to sanitation as to the general practice of medicine—the Good Samaritan. Indeed, of late years it is recognized that those come nearest to this ideal of beneficence who devote themselves to the prevention rather than to the mere cure of disease.

11. Obverse. Within a circle, the Good Samaritan. Inscription: Masathvsets in. Reverse. Inscription: . . . (New) England An . . (no). Within a beaded circle, 1652 | xii | O.

Dickeson. *American Numismatic Manual*, p. 63, pl. vi., fig. xii.

Crosby. "Early Coins of America," p. 67, fig. 23.

Frossard. "Monograph, etc.," p. 48.

"The Good Samaritan shilling" in the Pembroke Collection in England, as described by Crosby. "Possibly an experimental or pattern piece, made about the same period as the Pine-Tree shilling. Their great rarity would indicate the rejection of the pattern" (*Coin Collectors' Journal*, v., July, 1880, p. 111). It was considered by Dickeson to have been a Pine-Tree shilling upon which the new device had been substituted for the original. This is asserted by Crosby to have been impossible, upon the ground that no Pine or Oak-Tree shillings have the inscription existing upon the reverse of the "Good Samaritan." The device upon this piece is considered by Dr. S. A. Green, of Boston, one of the editors of the *American Journal of Numismatics*, to have been "undoubtedly the work of some English apothecary" (*loc. cit.*, October, 1870, p. 40).

12. Obverse as preceding. Reverse as preceding, but without O beneath xii.

Crosby. Fig. 22.

This was in the Bushnell sale, June 20th–24th, 1882, No. 145, was figured, and thus described : "The die very much cracked on reverse, rendering it impossible to strike any more after this one, and it was very likely that only one impression was struck. A genuine struck coin. This celebrated piece has been known to be unique for over two hundred years, and is one of the greatest gems of this collection. It was highly prized by Mr. Bushnell, who considered it, the New York doubloon, and Lord Baltimore penny his most important pieces, valuing it at more than $1000, and we consider it worth any amount that can be paid for it." The following criticism appeared within a few weeks after : "Sold for $650, but in our opinion and that of a large majority of experts an undoubted fabrication, and worth ten dollars at the outside" (*Coin Collectors' Journal*, vii., August, 1882, p. 125). Mr. Bushnell himself made a long statement toward proving the authenticity of his coin. The remarks are reproduced by Crosby, who unhesitatingly pronounces in its favor. See also *Magazine of American History*, viii., p. 635.

13. Obverse as preceding. Above, Fac-simile. Reverse blank.

"Pembrochiæ numismata, etc.," xiv., p. 4.

Dickeson, p. 63.

The Pembroke Good Samaritan as described by Dickeson.

14. Obverse as of those preceding the last. Reverse. Within a beaded circle an oak tree, bare. Inscription as on obverse.

A specimen of this, in gold, the device on reverse being called a Pine Tree, was in the Bangs sale of September 24th, 1874, No. 210, with the following note : "Not offered as having been struck at the time of the Pine-Tree money, but very well struck, and very rare in this metal." As comment upon the above, it was soon said : "No doubt one of Wyatt's fabrications. The Good Samaritan piece was not a coin, and all which were ever struck in gold (and no one knows how many besides) came from the same unscrupulous hand, and were got up to deceive unsuspicious collectors" (*American Journal of Numismatics*, October, 1874, p. 47). Further discussion regarding the original character of the Good Samaritan issues will be found in the same journal for July, 1882, p. 20 ; October, 1882, p. 44 ; and October, 1883, p. 48. A second

specimen in gold appeared at the Woodward twentieth sale, November, 1878, and still another, struck over an English guinea, and considered unique, at the Woodward twenty-first, in March, 1879.

An electrotype of the Oak-Tree variety of the Good Samaritan is in my collection.

We now descend from the realms of conjecture to a trio of utilitarian tokens.

15. Obverse. Inscription : Good Samaritan. Above, 1862. Device, a cooking-stove. Reverse. Goodrich & Gay (etc., etc.). * Grand Rapids, Mich. * (*Coin Collectors' Journal*, vii., October, 1882, p. 154).

16. Obverse same as preceding, but date 1863, and with thirteen stars. Reverse as preceding, but from a different die. *Ibid.*, vii., p. 154.

This is in my collection.

17. Obverse as the last preceding. Reverse. Ketcham & Barker (etc., etc.). * Toledo, Ohio *. *Ibid.*, viii., October, 1883, p. 147.

Furthermore, the Good Samaritan is represented upon the medals of the Howard Association of Norfolk, Va., and the Savannah Benevolent Association, which will hereafter be described, under Section X., the medals of Yellow Fever.

And, finally, the most sacred emblems of religion have been employed, allegorically and in reference to the sanitation, here synonymous with the salvation, of the soul. A medal of Pope Leo XII. is in point.

18. Infirmvs Eram Et Visitatis. Van Peteghem Catalogue, Paris, 1881, No. 145.

The following instances are from the medals of Pope Gregory XIII.:

19. Sic Exaltatvs Sanat. Scilla. "Breve Notizia delle Monete Pontificie," pp. 57, 247. A silver teston, struck at Rome.

20. Svscipe Et Valebis. *Ibid.*, pp. 58, 247. Silver testons, struck both at Ancona and Macerata.

21. Imago Salvtis. *Ibid.*, p. 60. A silver half-grosso.

The same is true of some of the medals of the Reformation, as, for instance, a silver jeton with the legend :

22. Salvator Mundi Salus Nos(ter). Lancelin Catalogue Paris, 1875, No. 302.

The number of distinguished medical and other medallists who have been known as general sanitarians merely, either by what they have personally effected or have written upon in this direction, will at first seem but meagre. I have postponed, however, the mention of many who are thus recognized by fame—Rush and Davis, for instance, among Americans—until the consideration of the more limited groups into which the main subject naturally subdivides. To render the classification more perfect, I shall describe the medals of each under the head of the countries to which they respectively belong, and shall here, as already intimated, merely instance those persons who are known for general rather than for distinctly special accomplishment in the field of sanitation. I shall endeavor, as we proceed, to present reference to their several published works upon each successive topic. I shall also give, so far as I can ascertain them, the dates of their birth and death.

In this connection I may state that the medal of not a single American physician seems to have been known to any foreign writer upon medical or scientific numismatics, and that but two other Americans have been enumerated by them who can be classed as sanitarians—namely, the two Benjamins—Franklin, and Thompson, Count Rumford—the recognition of both of whom may in a measure have depended upon their long residence abroad and close affiliation with foreign scientists.

A. The United States.

Dr. Henry Ingersoll Bowditch, of Boston (1808–), President (1877) of the American Medical Association, and for several years chairman of the State Board of Health of Massachusetts.

"Address on Hygiene and Preventive Medicine, delivered before the International Medical Congress, at Philadelphia, September 5th, 1876" (Transactions International Medical Congress, 1876). *Ibid.*, Philadelphia, 1876, 8°.

"Public Hygiene in America; being the Centennial Discourse delivered before the International Medical Congress, Philadelphia, September, 1876." Boston, 1877, 8°.

"Sanitary Organization of Nations" (Boston *Medical and Surgical Journal*). *Ibid.*, Cambridge, 1880, 8°.

As has been the case with too many of the leaders of the

medical profession, there is as yet lacking a special and personal medal in honor of Dr. Bowditch. He received, however, during his studentship in Harvard University the medals of two of the college societies, the legends upon which are so appropriate in all respects to the results of his long career, both as physician and sanitarian, that they may well be admitted here. Philosophy has, under divine direction, been the guide of his life. The harvest has responded to his youthful vows. Though the most independent of men, he has contributed his full measure to the harmonious work, together, of our profession. Dr. Bowditch graduated at Harvard in 1828.

23. Obverse. In field, *Φ B K* (Philosopheia Biou Kubernetes). A hand below, to right, pointing diagonally upward to a cluster of six stars. Reverse. S P (within an oval of many dots joined in hexagonals) | September 5th | 1781. Below, engraved, the name of the recipient. Edges chased. Rectangular. Silver. 18 x 18.

This is the Phi Beta Kappa medal, confined to the few higher scholars of each graduating class. My own medal of the same society I have always doubly valued from its being a tangible link of union with such men as Dr. Bowditch.

24. Obverse. An iron kettle filled with cooked corn-meal. Above, two hands, the one ladling into a platter held by the other. Above, H. P. C. Below, a band with the legend: Seges Votis Respondet. Reverse. A sphinx, above a wreath of flowers. Legend: Concordia Discors. Octagonal. 24 x 24.

The medal of the Hasty Pudding Club of Harvard University.

Dr. Bowditch will be again referred to in Sections V., Drainage; VIII., Diet; X., Diphtheria and Consumption; and XI., Military Hygiene.

Dr. David Hosack, of New York (1769–1835).

Although I shall subsequently allude to Dr. Hosack as a writer upon epidemics, under Section X., Typhoid, I introduce him here as having made valuable suggestions regarding the "Means of Improving the Medical Police of the City of New York" (New York, 1820, 8°). In my previous paper (*New England Medical Monthly*, December, 1886), I spoke of him in another connection still, as a distinguished obstetrician.

25. Obverse. Head to right, the hair brushed upward. Inscription: David—Hosack, M.D. Upon edge, in front of neck, Furst. F. Reverse. A multitude of emblems—namely, to left a short cylindrical column, upon which stands a lyre, and against it at either side recline the staff of Æsculapius and a spade. To right, a mounted sphere, against which are piled a bust, a mallet, palette with brushes, scroll and note-book. Upon the ground between, a square and compasses, and apparently a couple of cigars, though they may be paint tubes. Legend: Arts and Science. Exergue: Furst F. Edges lined. Bronzed copper. 22.

The error in placing a dot after the engraver's name upon the obverse will be noted. In the catalogue of the Haseltine sale of August, 1884, the head was described as facing to left, which, though true in a former sense, is not in accordance with the more modern rule. It was struck at the United States Mint, for whom or at whose request seems unknown. The question has been raised by Mr. F. A. Wood, then corresponding secretary of the American Numismatic and Archæological Society (*American Journal of Numismatics*, i., p. 16), and has been repeated in the *Journal of American History*, but no answer appears to have been given.

This is in the Lee and Fisher Collections and my own.

Dr. Joseph Meredith Toner, of Washington, D. C. (1825–).

Dr. Toner's name will ever be remembered, not merely as a president of the American Medical Association, but as among the most eminent of American physicians. His gift to our country of his great medical library, his establishing prize funds at Georgetown College and the University of Pennsylvania, and his foundation of lectures at the Smithsonian Institution will be of this most wise benefactor of our art in perpetual remembrance. A prolific writer, Dr. Toner will be repeatedly referred to in the different sections of this paper, under II., Water Supply; VII., Ventilation; X., Inoculation, Vaccination, Cholera, Yellow Fever, Syphilis; XI., Military and Naval Hygiene; XII., Climate; and XIII., Registration. In the present general connection he is cited because of his address as president of the American Public Health Association, New York, 1876.

26. Obverse. Within a circle formed of a re-entering serpent, Toner | Medal. Inscription: University. of. Georgetown. Exergue: 1882. Reverse. A serpent similarly circled. In field, To | | for | Progress | in Natural Science. Legend: Vidit Deus cuncta quæ fecerat et erant valde bona. Exergue: a thunderbolt. Gold. 18.

This medal is given for the collection and naming of the greatest number of specimens in any department of natural science. That from which the above description was taken was awarded to Dr. Louis A. Kenzla, from whom I have received impressions.

27. Obverse. Head to left. Behind it, Toner. Beneath neck, Barber. Reverse. Oak branches tied by ribbon. Enclosed space vacant, for inscription. Edges lined. Gold. Silver. Bronze. 23.

The prize medal founded by Dr. Toner for the Medical Department of the University of Pennsylvania. Through the kindness of Dr. Seaman, of New York, late Chief of Staff, Charity Hospital, Blackwell's Island, I have been permitted to examine the gold Toner medal conferred upon himself. Upon the reverse, within the branches, is inscribed: Toner Medal. | Awarded to | Louis L. Seaman | Jefferson | Medical College | March, 1876. Dr. Toner writes me that, through oversight of the college authorities, it was neglected to add to the above, For the best thesis based on original investigation. A copy without inscription is in the Lee Collection, and I also possess one, a gift from the friend, of a great many years standing, who was its founder.

Dr. John Collins Warren, of Boston (1778–1856).

"Physical Education and the Preservation of Health." Boston, 1846, 12°.

"The Preservation of Health, with Remarks on Constipation, Old Age, Use of Alcohol in the Preparation of Medicines." Boston, 1854, 16°.

Dr. Warren was the nephew of Dr. (General) Joseph Warren, who fell at Bunker Hill, and whose medals will be hereafter described in Section XI., Military and Naval Hygiene. He was the son of Dr. John Warren, the founder of the Medical School of Harvard University, and was himself one of the orig-

inators of the Massachusetts General Hospital. Universally known as a surgeon merely, it will be perceived that Dr. Warren was no less a sanitarian. The medal to be described, the Franklin medal of the city of Boston, was the very first of its kind that was ever conferred. Though its recipient was at the time but a lad, the fact commemorated furnishes interesting evidence of characteristics which became even more marked in his later life.

28. Obverse. Two pens crossed, surmounting an open book. Above, The Gift of | Franklin. Reverse. Adjudged | by the | School Committee | as a | Reward of Merit | to | John C. Warren | 1792. The last two lines are engraved. Silver. 22.

This medal is now owned by Dr. Warren's grandson, Dr. J. Collins Warren, of Boston, to whom I owe its impressions. It is figured in the *American Journal of Numismatics*, October, 1874, p. 25.

In the present connection I may state that still another of the Boston family of surgeons, Dr. Jonathan Mason Warren (1811–67), son of the preceding, grandnephew of Dr. Joseph Warren of the Revolution, and father of the present Dr. Warren, is also among the as yet very few American medical medallists. His name, with that of Dr. John Homans, Sr., of Boston, appears as an officer of the Massachusetts Humane Society for 1854, upon the one of its several medals that was cut by Wyon, of London. This medal is in my collection.

Marine life-saving medals, of which that last referred to is an example, have by some been thought to belong among medical or even sanitation medals, upon the ground, I presume, that the physician is the ideal conservator of the race, or, more properly, because for the resuscitation of half-drowned persons there is need of anatomical and physiological knowledge ; or, again, that such preservation lessens the death statistics. There are quite a number of these medals, struck by Congress and foreign governments and humane societies, at home and abroad. Though I own several of them, I consider that the subject hardly comes legitimately within the present limits.

There are three varieties of the John Howard (English) tokens, that are classified by United States collectors as in the

early American series. These I shall describe, very shortly, in their more legitimate place, as the obverse (Howard) die was cut for English use, though subsequently muled for American. They are to be distinguished from the John Eager Howard medals of United States Revolutionary history, for the victory of Cowpens, etc.

The name of John Howard has been further perpetuated in this country, in worthily bestowed honor, by the Howard Associations of Norfolk and Memphis, whose medals will be hereafter considered under Section X., Yellow Fever.

B. England.

Roger Bacon, of Oxford (1214–92. The medal has 1294, but Kluyskens asserts that it is wrong).

"De retardandis senectutis accidentibus et sensibus confirmandis." Oxford, 1590, 8°.

29. Obverse. Bust to right, with tonsure and cowl. Beneath, Gayrard F. Inscription: Rogerivs—Bacon. Reverse. Natus | Ilchester | Com. Sommerset (*sic*) in Anglia | An. MCCXIV. | Obiit | An. MCCXCIV. | ——— | Series Numismatica | Universalis Virorum Illustrium. | ——— | MDCCCXVIII. | Durand Edidit. Bronze. Lead. 26.

Rudolphi, Kluyskens, and Duisburg have the dates in Roman numerals. Kluyskens has Somerset.

Rudolphi. "Recentioris ævi numismata virorum de rebus medicis et physicis meritorum memoriam servantia," p. 6, No. 23.

Kluyskens. "Des Hommes célèbres dans les sciences et les arts, et des médailles qui consacrent leur souvenir," i., p. 34.

Duisburg, p. 216, DLXXV.

This is in the Fisher Collection and my own.

Dr. John Edward Gray, of London (1800–75), Superintendent Natural History Department British Museum. Dr. Gray was prominent in prison reform and the advancement of general sanitary measures.

30. Obverse. Two busts to right, under which, G. G. Adams Sc. 1863. Inscription: J. E. and M(aria). E(mma). Gray. (His wife.) Reverse. In three lines, within a crown of laurel, Trust in the Lord and do good.

Duisburg, Suppl. I., 1863, p. ii.

John Howard (1720 [Duisburg ; 1726, *American Cyclopædia ;* 1727, Rudolphi and Kluyskens]–1790).

Though ordinarily known but as a pure philanthropist of the very highest order, Howard was educated as a medical man. I shall hereafter refer to his work upon Lazarettos and the Plague, in Section X. of this paper. Here belongs his "State of the Prisons in England and Wales, with Preliminary Observations and an Account of some Foreign Prisons," 1777, 4°. Appendix in 1780. A second Appendix in 1784.

There are quite a number of the Howard tokens. Till now there has existed no list of them that has been at all complete. Rudolphi says that the idea of placing the effigies of the most humane and compassionate of men upon pieces of money of little value that would circulate among the poorest and lowest classes, who would thus be reminded of so pure an ideal, deserves very great praise (edition of 1829, p. 77), and the remark is fully concurred in by Kluyskens (ii., p. 43). This is a more worthy view to take of the diversity of these tokens than to suppose, as has been suggested, that they were struck, especially the mules, merely to increase "the rage" for them among numismatists. This latter explanation has even been urged against the Talbot Allum and Lee series of early American tokens as a reason for "rendering them valueless in the estimation of all discriminating collectors" (*Coin Collectors' Journal*, October, 1885, p. 157). In relation to the Howards, however, such is the deserved celebrity of the noble person delineated, and the rarity of several of the varieties of the tokens, that they will undoubtedly be hereafter considered as more and more valuable. No medical collection, at any rate, can be pronounced at all complete that does not possess one or more of them.

31. Obverse. Bust, with long hair. Inscription : Iohn Howard F.R.S. The points are three-cornered. Reverse. In monogram, the letters H.H. (H. Hickman). Inscription : 1792 Westminster—Halfpenny. Upon rim, Payable at the Iron Warehouse N° 3 Edgbaston Str^{t} Birm(ingham).

Duisburg has Lagarle, N° 5, and Edgraston ; and Neumann in his description has Hickmann.

Duisburg, p. 227, DC., no. 1.

Neumann, No. 23,580.

A token of Birmingham, Warwickshire, and Westminster, London. It was unknown to Rudolphi and Kluyskens.

32. Obverse. Bust to left, with long hair ; two buttons to coat. Inscription : Iohn Howard.F.R.S. Three-cornered points. Reverse. In monogram, H.H., as in preceding. Above, 1792. Inscription : Birmingham.Promissory.Half-penny. The points three-cornered. Upon rim, Payable at H.Hickmans Warehouse Birmingham.

Duisburg has no point after Howard or Birmingham. Kluyskens has neither the last nor after Promissory, and has Burckmans on rim.

Kluyskens, ii., p. 42.

Duisburg, Suppl. II., 1868, p. 27, DC., no. 8.

Neumann, No. 24,123.

Unknown to Rudolphi.

33. Obverse and reverse as last, save but one button on coat.

Neumann, No. 24,124.

This is rare, and was unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell. It is in my collection.

34. Obverse. Bust to left, with short hair. Inscription : Iohn Howard.F.R.S. The points are three-cornered. Reverse. The monogram H.H., as before. Inscription : Birmingham Promissory Farthing. Duisburg has dot after Promissory ; Kluyskens has Fartaing.

Kluyskens, ii., p. 42.

Duisburg, Suppl. II., 1868, p. 27, DC., no. 9.

Neumann, No. 24, 125.

Unknown to Rudolphi.

35. Obverse and reverse similar to the last, but the planchet is thicker, and has dentated edges.

Neumann, No. 24,126.

Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

36. As the last, but on rim H.Hickman's Warehouse Birmingham.

Neumann, No. 24,127.

Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

37. Obverse. Bust. Inscription : Iohn Howard F.R.S. Reverse. In monogram, the letters J.A.H.C. Inscription : Birmingham Promissory Farthing. 1792.

Duisburg, Suppl. I., 1863, p. 12, DC., no. 7.

Unknown to Rudolphi, Kluyskens, and Neumann.

38. Obverse. Bust to left. Inscription: Iohn Howard F.R.S. Below, Halfpenny. Reverse. Within a beaded circle, a sitting female facing left, with branch of olive on her left arm, which rests on a vase. With her right she directs a youth, with key, toward a prison. At her feet three vases, one of which is overturned. Above, irradiated, Go Forth. Legend: Remember the Poor Debtors in Goal (*sic*). In exergue, a rosette. Upon rim, Payable in Lancaster London or Bristol.

Duisburg, p. 227, DC., no. 2.

Neumann, No. 22,961.

A token of Lancaster, Lancashire. It was unknown to Rudolphi and Kluyskens.

39. Obverse and reverse as preceding. Upon rim, Payable at London or Dublin. × . × . × . ×.

Kluyskens, ii., p. 43.

Neumann, No. 23,369.

A token of London, Middlesex. Unknown to Rudolphi, Duisburg, and Rüppell. This is in my collection.

40. Obverse and reverse as preceding. Upon rim, Payable in Dublin or London. + . +.

Neumann, No. 25,112.

A Dublin token. Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

41. Obverse and reverse as before. Upon rim, Current Every Where + + + + + +.

Neumann, No. 25,432.

Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

42. Obverse as preceding. Reverse. Britannia seated, with lance and olive branch. Legend: Rule Britannia. Without date.

Neumann, No. 25,431.

Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

43. Obverse. Bust to left, with long hair. Inscription: Iohn Howard F.R.S. Philanthropist. (The bow between N and T. The N in front of frill.) Reverse. The City of Portsmouth Arms. A three-towered citadel; over the gate a shield upon which a leopard. Above, a horizontal crescent, sur-

mounted by a star-shaped eye ; bisecting the word Halfpenny. Legend : Chichester and Portsmouth. Exergue : 1794. Upon rim, Payable at Sharps Portsmouth and Chaldecotts Chichester.

Duisburg has Philanthropist. Neumann has 1797.

Duisburg, p. 227, DC., no. 3.

Neumann, No. 22,872.

A token of Portsmouth, Hampshire. Unknown to Rudolphi and Kluyskens. It is in my collection.

44. Obverse and reverse as preceding, save that on the former the bow is opposite N, and N under the frill.

This variety has till now been unrecognized. It was unknown to Rudolphi, Kluyskens, Duisburg, Neumann, and Rüppell. It is in my collection.

45. Obverse and reverse as preceding, save Portsmouth and Chichester. Inscription upon rim the same. Upon obverse, the bow opposite H. Upon reverse, C to left of centre of P.

Kluyskens, ii., p. 42.

Duisburg, Suppl. I., 1863, p. 12, DC., no. 3.

Neumann, No. 22,871.

This was unknown to Rudolphi. It is in the Lee Collection and my own.

46. Obverse and reverse as preceding, save that upon the former the bow is opposite N ; and upon the latter C is to the right of the centre of P.

This variety hitherto unrecognized. It was unknown to Rudolphi, Kluyskens, Duisburg, Neumann, and Rüppell. It is in my collection.

47. Obverse as preceding. Reverse. Britannia seated, leaning on shield, with lance. Inscription : Rule Britannia. Upon rim, Current Everywhere + + + + + +. Exergue : 1795.

Rudolphi and Duisburg have Philantropist, and do not mention inscription upon rim. The former thought that this merely stated the value of the coin as a halfpenny.

Rudolphi, p. 77, No. 325.

Kluyskens, ii., p. 42.

Duisburg, p. 227, DC., no. 5.

Neumann, No. 25,430.

48. Obverse and reverse as preceding. Upon rim, Payable at the Warehouse Liverpool.

Neumann, No. 22,011.

A token of Liverpool, Lancashire. Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

49. Obverse and reverse as preceding. Upon rim, Payable in London.

Neumann, No. 23,367.

Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

50. Obverse as preceding. Reverse. The Arms of Exeter; two winged horses supporting an armorial shield. Above, a lion, to the right, holding an orb. Beneath, upon a band, Semper Fidelis. Inscription: Exeter Halfpenny. Below, 17—92. Upon rim, Payable at the Warehouse of Samuel Kingdom. ×.

Neumann, No. 22,758.

A token of Exeter, Devonshire. Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

51. Obverse as preceding. Reverse. The Arms of York; a castle filled with soldiers; to the left, a drawbridge, over which four soldiers are passing. Above, Clifford's Tower. Exergue: A.D. 1100. Upon rim, Fear God and Honor the King. ×.

Neumann, No. 24,402.

A token of York, Yorkshire. Unknown to Rudolphi, Kluyskens, Duisburg, and Rüppell.

52. Obverse as preceding. Reverse. The Arms of Glasgow. Within a shield, a tree, upon whose branches there are birds. From it hangs a bell. Across its trunk a salmon. Legend: Let Glasgow Flourish. Upon rim, Payable at the House of Gilbert Shearer & Co.

Duisburg, p. 227, DC., No. 4.

Neumann, No. 24,769.

A Glasgow token. Unknown to Rudolphi and Kluyskens.

53. Obverse as preceding. Reverse. Liberty facing, erect, in right hand the pole and cap, in left a rudder; by her a bale. Legend: Liberty & Commerce. Exergue: 1794. Upon rim, Payable in London.

Kluyskens has et for &.

Kluyskens, ii., p. 42.

Neumann, No. 23,368.

This is considered by United States collectors as belonging in the early American series, and is prized accordingly. It

was unknown to Rudolphi, Duisburg, and Rüppell. It is in my collection. The reverse is that of the Talbot Allum and Lee New York cent of 1794. In the Woodward eighty-eighth sale of June 28th–29th, 1886, No. 761, it was catalogued as "*nude* bust (of Howard), much rarer than regular issue." I am in a position, however, to state that the alleged nudity does not exist, since I now myself possess the specimen in question.

54. Obverse and reverse as last. Upon rim, Payable at Store of + (*Coin Collectors' Journal*, x., October, 1885, p. 158, No. 6).

Also an "American." Unknown to Rudolphi, Kluyskens, Duisburg, Neumann, and Rüppell.

55. Obverse as preceding. Reverse. Within a circle a ship, to right, under sail, its mainmast dividing the words New York. Inscription: Talbot Allum & Lee. | One Cent (*Coin Collectors' Journal*, x., October, 1885, p. 158, No. 3).

The third of the "American" Howards. Unknown to Rudolphi, Kluyskens, Duisburg, Neumann, and Rüppell.

56. Obverse. Bust to right. Beneath, Barre. 1829. Inscription: John Howard. Reverse. Within a crown of oak leaves, Société de la Morale Chrétienne—Comité des Prisons. Silver. Bronze. 4 centimetres.

Kluyskens, ii., p. 41.

Duisburg, p. 227, DC., no. 6.

In Imperial Cabinet at Berlin. It was struck at Paris, and was unknown to Rudolphi.

Florence Nightingale, of London (1820–). "Notes on Nursing," London, 1850. Other of her works will be referred to hereafter. Her "Notes on Lying-in Institutions," 1871, I mentioned in my paper on the Medals of Obstetrics and Gynæcology (*New England Medical Monthly*, December, 1886). It is another department of sanitation than the present, to which her medal properly belongs. I shall therefore reserve its description until Section XI., that of Military and Naval Hygiene.

Dr. Edward Alexander Parkes, of Netley. "Manual of Practical Hygiene," etc. London, 1864, 8°.

57. The hospital at Netley. Legend : Ἡ περι τω σωμα και την φνχην Ἰγιεια. Gold.

I only know this medal through its mention by Dr. Ezra M. Hunt, of Trenton, N. J., in THE SANITARIAN, February, 1886, p. 42. It was unknown to Duisburg and Rüppell. Dr. F. de Chaumont, of Woolston Lawn, Southampton, England, the successor of Dr. Parkes at Netley, has promised me a full description, but it has not yet been received. Dr. Parkes will again be referred to under Section X., Malignant Dysentery and Cholera.

C. THE NETHERLANDS.

Dr. Adolphe Pierre Burggraeve, of Ghent (1806–). "La Longevité Humaine." Paris, n.d., 12°. "Nouvelle Macrobiotique," 1855.

58. Obverse. Bust facing, with decoration in button-hole. Reverse. Adolp. Burggraeve | né a | Gand | le | 8 Oct. MDCCCVI. Silver. 40 mill. Dies cut by Ch. Onghena.

Kluyskens's description in his book of 1859 differs somewhat from his figure. In the former there are Adolphe, Octobre and 1806 (Roman). In his work of 1884 he corrects the two first of these discrepancies, but retains the last.

Kluyskens, i., p. 164, fig.

Ibid., Num. Med. Belge, 1884, p. 28.

Unmentioned by Duisburg and Rüppell.

Dr. Burggraeve will be again referred to under X., Vaccination, Cholera, and Syphilis, and XI., Military and Naval Hygiene.

Charles (Latour) Rogier, of Liege (1800–85). "Promoter of the Public Health."

59. Obverse. Bust to right. Beneath, engraved, Jouvenel 1851. Inscription : Charles Rogier Ministre de l'Intérieur. Reverse. Création des Chemins de fer Belges (etc., etc., etc.) Hygiène Publique. Bronze. 5 centim.

Kluyskens, ii., p. 384.

Unmentioned by Duisburg or Rüppell.

60. Obverse. Bust to right, with military coat and decoration. Beneath shoulder, Leopold Wiener F. Inscription : Charles Rogier—Ministre de l'Intérieur. Reverse. Æsculapius half nude, with Panaceia and Telesphorus seated, the

first and last holding wreaths. Behind them, Hygeia with patera and serpent. At their right and left, square columns. Upon the former, (C)onseils | de | (S)alubrité | — | Prix de | Propreté, and upon the latter, Congrès | Hygièni(que) | — | Assainiss(ement). Inscription : Au Promoteur de l'Hygiène Publique—en Belgique. Exergue : 1852 | L W (Leopold Wiener). Bronze. 63 mill.

Telesphorus, upon ancient medals always represented as completely cloaked, is here nude. In Kluyskens's figure, Congrès and Propreté are not accented.

Kluyskens, ii., p. 384, fig.

In the Lee Collection. Unmentioned by Duisburg or Rüppell.

A third medal of Rogier will be described under Section V., Drainage. His name appears upon several others still, unconnected with sanitation, which are given by Guioth, "Hist. num. de la Rév. belge, etc." Hasselt, 1845, pp. 34, 53, 61, pl. 28, 51, 56, 57.

Jan Hendrik van Swinden, of Amsterdam (1747–1823. Though the medal states the birth as in 1747, and at Amsterdam, Kluyskens gives it as 1746, and at The Hague). President of Commission on Public Health.

61. Obverse. I.H.Van Swinden. Reverse. Natus Amstelodami An. 1747. Obiit An. 1823. Bronze. 45 mill.

Kluyskens omits the dot after first date.

Rudolphi, p. 153, No. 632.

Kluyskens, ii., p. 558.

Duisburg, p. 183, CCCCXCV.

Van Swinden will again be referred to under Sections II., Water Supply ; V., Drainage ; VI., Sewerage ; X., Epidemics ; and XIII., Registration.

(*To be continued.*)

A BRUTAL TEACHER whipped a little boy for pressing the hand of a little girl who sat next to him in school. After which he asked the child why he squeezed the girl's hand. "Because," said the little fellow, "it looked so pretty, I could not help it." What punishment did the teacher deserve?

EDITOR'S TABLE.

SMALL-POX IN THE MASSACHUSETTS PAPER MILLS. WHO IS RESPONSIBLE FOR IT?

THE *Boston Medical and Surgical Journal* of April 14th reports: "Two cases of small-pox were lately reported from Huntington among employés of the Chester Paper Company. An investigation of the circumstances by the Secretary of the State Board of Health showed that rags were the probable medium of contagion; but whether domestic or foreign rags, it was impossible to determine definitely. A portion of the domestic rags were from New York, where small-pox has been prevalent, of late, and the probability seemed to Dr. Abbott to be in favor of these rags as being the medium of contagion." A week later (April 21st) the same journal continues: "Neither of the victims had ever been vaccinated. One, a girl of thirteen or fourteen years old, goes often to the rag-room, where her grandmother works, and even at times helps her. The old woman has a typical vaccinal scar and does not contract the disease, but the child, unprotected by any vaccination, takes the small-pox. This child had been in attendance at the public schools, contrary to law, and yet no objection had been made to her attendance by the town authority. Coincidentally with these revelations of culpable negligence on the part of the mill proprietors and town authorities, whereby a whole community was endangered through the infection supposed to have been brought by rags, we have a bill passed to a second reading in the lower house of the State Legislature, relaxing the precautions now by law required in such matters, and providing that an unvaccinated pupil may be allowed to attend public schools on the certificate of two reputable physicians that 'it is not advisable to vaccinate such child, and that no injury to the public health is likely to occur from the admission of such child to the public schools.' If a child's health is not good enough to admit of his vaccination, is it good enough to warrant sending him to school unvaccinated, and can it be true, whether certified to by 'reputable physicians' or not, that school attendance

of unvaccinated children, exposed as they are in manufacturing towns to multiple sources of contagion, is likely to cause 'no injury to the public health'?

"The report to the Boston Board of Health by Dr. J. H. McCollom, City Physician, as to the recent cases in the mill of the Parsons Paper Company, at Holyoke, . . . agrees substantially with the facts heretofore laid before our readers. Of the two kinds of foreign rags used in this mill, those from Germany bore the certificate of the United States inspector that they had undergone (sulphur) disinfection. The other kind consisted of Russian rags sorted and packed at Königsberg, whither they were brought ungraded, and where they lay stored for months before being baled. They were sorted in nine or ten different grades, and the importers averred that no case of small-pox had occurred among their workmen for years, or was 'known to exist' (*sic*) in Königsberg."—Yet in this outbreak in the mill at Huntington, as in that in the Parsons mill at Holyoke two months before, the same disposition is manifest in the published account to ignore the responsibility of the health authorities, and place the blame upon irresponsible persons. Although "it was impossible to determine whether the rags were domestic or foreign," the question of disinfecting imported rags is wholly ignored. We would not be understood by this remark to imply that domestic rags are not also liable to convey small-pox, and also other infectious diseases, insomuch, indeed, that *all* old rags should be inhibited as an article of traffic, subject to the surveillance of the health authorities. But it is the misfortune of the health authorities of Massachusetts and the *Boston Medical and Surgical Journal* that they appear to be unwilling to profit by experience, and are purblind to their own responsibility in the premises. Under date of February 13th, 1886, the "manufacturers of paper or importers of foreign rags and dealers in the same," representing twenty-seven Massachusetts firms and their lawyers, protested against and, about six months thereafter, secured the virtual abrogation of the following excellent ordinance of the Board of Health of Boston, which went into effect June 1st, 1885, for the prevention of the introduction of infectious diseases by means of imported rags:

"That on and after this date, all rags arriving at this port from any foreign port shall, before being discharged, be disinfected under the supervision of an officer of this board, and in a manner satisfactory to this board."

They averred that

"While more than equally interested with the rest of the public in preventing the introduction into this country of any disease, by means of rags, and with a full sense of the responsibility we take by our present action, we respectfully protest against this sweeping order, because we believe that it is unnecessary for the protection of the public against disease, as shown by the country's experience of over half a century in the importation of foreign rags.

"Old rags, for use in paper-making, have been for many years imported, in large quantities, from nearly all the principal ports and countries of Europe, Asia, and Africa, and we, individually and respectively, have always used, and are now using, large quantities of foreign rags collected in various parts of the Old World in the manufacture of paper at our respective mills. These rags are carefully assorted at the mills into various grades before use, almost every rag being separately handled in this process, and a large number of our operatives coming in direct contact with them; yet, notwithstanding this, we are able to state that, in the course of our experience as manufacturers, we have never known of any case of disease at our respective mills which could be traced to, or was believed to have been caused by, foreign rags; that no case of cholera has ever been caused by rags, domestic or foreign, and that only very rarely have cases of small-pox occurred at our mills, and these were, in every instance, traced to domestic rags."

And appended was the following statement, signed by the representatives of seven steamship lines:

"We, the undersigned, representing foreign steamship companies plying between Boston and European ports, respectfully represent that the large business heretofore done by us, in the conveyance of foreign rags to this port, has very largely fallen off and been transferred to New York and other ports, in consequence of the regulations enforced at Boston by our local Board of Health, requiring the disinfection of all rags on arrival here, whether they have been disinfected before shipment or not; while rags arriving at New York, accompanied by a certificate certifying to previous disinfection, are allowed to be landed without further trouble. You will thus see that rags which are not allowed to be landed here without disinfection

can be imported at New York, and brought on here by local routes, showing the inconsistency of the present regulations in force at this port.

"Rags being a very important item of our import trade, it is evident that the interests of Boston as a commercial port are injured in an unnecessary manner, and that the steamship lines running to this port at present labor under a very serious disadvantage compared with those running to New York."

These averments were endorsed by a considerable number of the physicians of Boston, accompanied by the declaration of the attorney for the manufacturers, etc., that "the disinfection of foreign rags is unnecessary, as shown by a vast preponderance of testimony of scientific and medical men," notwithstanding the published records of the State Board of Health of Massachusetts of the same paper mills as those represented in this petition, furnish abundant evidence to the contrary.

The ordinance as modified provides for the "free admission of foreign rags when accompanied by a certificate of the United States consular officer at the port of departure, that such rags were not gathered, or baled at, or shipped from any place which had been infected with any contagious or infectious disease, in an epidemic form, within six months prior to the shipment of said rags. All foreign rags not accompanied by such a certificate are to be regarded with suspicion, and treated accordingly." With the uncertainty of the prime sources of imported rags and the length of time they may retain infection, our readers are abundantly familiar. Yet our esteemed contemporary seems prone to shift the responsibility for the recent outbreaks of small-pox in the Massachusetts paper mills from the shoulders of the health authorities to the mill proprietors, town authorities, and school officers, as if they were, ever have been, or are ever expected to be the protectors of the public health. The suggestion conveyed is: if all the mill operatives had been effectually vaccinated, there would have been no outbreak of small-pox among them, and there is no evidence whatever of danger of other infectious diseases by the same means! Verily, this is a very unpropitious beginning of the restored powers of the Massachusetts State Board of Health.

THE RECENT RAG LAWSUIT in New York, instead of showing any collusion between the Health Officer of the port

and his codefendant, or any malfeasance by the Health Officer, has rather demonstrated the ill consequences of too much leniency to those who have not deserved it, and a lack of sufficiently rigid quarantine restrictions. In the first place, the quarantine laws of New York contemplate no such innovations as those assumed by the Secretary of the Treasury in 1884, inviting the conclusions of a conference which were shortly proven to be inefficacious for their intended purpose. But the Health Officer of the Port of New York, having consented to those conclusions, was too tardy in renouncing them after they had been revoked, and after he was rehabilitated with the total responsibility of protecting the port from the introduction of infectious diseases, by the succeeding administration. And, while adopting the most approved method of disinfecting rags in bale, he erred in allowing himself to be induced by the Assistant-Secretary of the Treasury or any one else to fix the plant of the apparatus at the Baltic Stores, Brooklyn, instead of at some place more directly within the jurisdiction of the quarantine establishment. He had the right, however, with the assent of the Brooklyn Commissioner of Health, to designate the Baltic Stores as a disinfecting depot, but the conducting of the process of disinfection at that place by operatives under no quarantine restrictions was far from being calculated to convey a correct impression of the danger of handling infected rags. And the mistake was the greater in that, after the plant had been changed to a floating scow, he still allowed the process of disinfection to be conducted by persons not connected with the quarantine service instead of under his own personal supervision or that of a deputy responsible to him. The quarantine laws of New York delegate no such privilege. They hold him and him *alone* responsible for all such duties. They expressly provide that, "Whenever any expense shall be incurred by the health officer, or whenever any services shall be rendered by him or his employés in the discharge of the duties imposed upon him by law in relation to vessels, merchandise, baggage, dunnage, persons, or burials, under quarantine, such expenses and services shall be paid for to the health officer by the masters of the vessels for which such expenses shall have been rendered, or in which the merchandise, baggage, dunnage, and persons

shall have arrived." Indeed, nothing can be clearer to persons familiar with the quarantine laws of New York than that the expenses incurred for disinfecting rags, as other expenses, are payable to the health officer, and to *no one else*. *He* should have incurred the whole expense for the use of the disinfecting apparatus, and should have remunerated himself in the manner provided by law, instead of attempting to shift any part of the responsibility for the exaction of service or payment for the same. This is the purport of the judgment in the case according to all the evidence adduced. There was no evidence whatever of any dishonorable conduct by the health officer or of any collusion between him and his codefendant in the suit. And it is sincerely to be hoped that the result will be such an exclusive and unequivocal direction and supervision of the disinfection of rags, as well as of all other details in the exercise of the duties of the health officer in the future, as will relegate the false issues of the complainants in this suit to their wonted place—the chicaneries of unprincipled tradesmen who would introduce a deadly epidemic into the country rather than incur the expense of disinfecting their wares.

AMERICAN PUBLIC HEALTH ASSOCIATION.

The Executive Committee have selected the following topics for consideration at the Fifteenth Annual Meeting, to be held in Memphis, Tenn., November 8th–11th, 1887:

I. The Pollution of Water-Supplies.
II. The Disposal of Refuse Matter of Cities.
III. The Disposal of Refuse Matter of Villages, Summer Resorts, and Isolated Tenements.
IV. Animal Diseases Dangerous to Man.

These topics are exceedingly important, and apply to every section of the United States and the Provinces. Therefore it is hoped that sanitarians, and others who have had experience and observation in these matters, will give their views to the Association, and through it to the public.

All persons who propose to present papers at the next meeting of the Association will be governed by the following By-Laws of the Executive Committee:

"4. All papers presented to the Association must be either

printed, type-written, or in plain handwriting, and be in the hands of the secretary at least twenty days prior to the annual meeting, to insure their critical examination as to their fulfilling the requirement of the Association.

"5. If any paper is too late for critical examination, said paper may be so far passed upon by the Executive Committee as to allow its reading, but such paper shall be subject to publication or non-publication as the Executive Committee deem expedient.

"6. All papers accepted by the Association, whether read in full, by abstract, by title, or filed, shall be delivered to the secretary as soon as thus disposed of, as the exclusive property of the Association. Any paper presented to this Association and accepted by it shall be refused publication in the transactions of the Association if it be published in whole or in part by permission or assent of its author in any manner prior to the publication of the volume of transactions, unless written consent is obtained from the Publication Committee.

"7. Day papers shall be limited to twenty minutes and evening papers to thirty minutes each."

Invitations extended to individuals to prepare papers for the Association do not imply their acceptance by the committee, merit alone determining that question.

While the above topics have been selected for consideration at the next annual meeting, it does not follow that papers of merit upon other sanitary subjects will be rejected by the Executive Committee.

The Local Committee of Arrangements at Memphis have already begun the work essential to a large and successful meeting. While the locality alone would ensure a large attendance, no efforts will be spared by the committee to make the meeting both profitable and enjoyable for all who attend. A circular will be issued in ample time before the meeting, giving full information in regard to transportation and hotel rates. All communications relating to local matters should be addressed to G. B. Thornton, M.D., chairman local board of health, Memphis, Tenn.

Blank applications for membership can be obtained by addressing the secretary—

CONCORD, N. H. IRVING A. WATSON, M.D.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION will hold its Fourth Annual Meeting in Baltimore, Tuesday and Wednesday, May 31st and June 1st, 1887, and will immediately precede the meeting of the Association of American Physicians, to be held in Washington. We are glad to be informed that many papers have been promised by members, and that a very successful meeting is anticipated.

THE GOVERNMENT YELLOW-FEVER COMMISSION.—We are gratified to learn that the President has designated Dr. George M. Sternberg, U. S. Army, to investigate the merits of inoculation for the prevention of yellow-fever.

INTERNATIONAL CONGRESS.—The Council of the English Society for the *Study* and *Cure of Inebriety* have completed arrangements for an International Medical Congress, to be held at *Westminster Hall*, London, July 5th and 6th, 1887. The object of this Congress is to present and discuss the problems of inebriety medically, and from a purely scientific standpoint, by the best authorities, thus laying the foundation for a broader and more exact study of this subject.

Papers and addresses are promised from a large number of the most distinguished physicians, of whom the following are well known :

Dr. Magnus Huss, *of Stockholm ;* Dr. Moeller, *of Brussels ;* Dr. Baer, *of Berlin ;* Dr. Magnan, *of Paris ;* Dr. Binz, *of Bonn ;* Professor Marstorf, *of Vienna ;* Drs. Kerr, Drysdale, Richardson, Cameron, Carpenter, Burrows, Bristowe, and others, *of England ;* Drs. Parrish, Crothers, and Mason, *of America ;* Dr. Fitch, *of Halifax*, and many others.

PHYSICAL CULTURE.—This year, for the first time, Dr. Sargent will open, at the Hemenway Gymnasium, a summer course of physical training, designed to supplement the Physical Training School for Teachers, which has been so successfully carried on in Cambridge for the last five years. The design of the school is to qualify men and women to supply the demand for competent instructors in the Sargent system of examination and physical training. The present need is for intelligent organizers and leaders rather than for skilful

performers—for those who can arouse enthusiasm for health and development rather than for feats and display.

Aside from the immediate object of this course, the opportunity here afforded to persons who are otherwise occupied during the rest of the year for obtaining a better knowledge of their physical condition, and for laying the foundation of a better physical life, is an encouraging feature of the scheme.

AMENDE HONORABLE.—We are gratified to publish that our esteemed contemporary, *The Annals of Hygiene*, in its current issue makes full and unqualified apology for the omission to credit the illustrations of the series of papers it has recently published, to which we referred in our April number, to the excellent work of Dr. J. Pridgin Teale on the "Dangers of Health."

MORTALITY AND MORBILITY STATISTICS AT MOST RECENT DATES.

ALABAMA.—*Mobile* reports 55 deaths during the month of March in a population of 31,295, of which 12 were under five years of age. Death-rate per 1000, 17.16. From zymotic diseases there were 3 deaths, and from consumption, 9.

CALIFORNIA.—The mortality for the month of March, reported by the Secretary of the State Board of Health from 75 towns and cities containing an estimated population of 609,600, was 889. Consumption, 182, a largely increased mortality over the usual rate; pneumonia, 77; bronchitis, 19; congestion of the lungs, 7; diphtheria and croup, 41; typhoid-fever, 14; small-pox, 11—9 in Los Angeles and 2 in San Diego.

San Francisco.—J. L. Mears, M.D., Health Officer, reports for fiscal year ending June 30th, 1886, including reports of W. F. McAllister, M.D., Quarantine Officer, and William T. Bell, M.D., Resident Physician of City and County Hospital, and Physician to 26th Street Hospital: Deaths, 5322, an increase of 34 over preceding year. Seven hundred and seventy-five, or 14.56 per cent, were caused by zymotic diseases, chiefly: diphtheria and croup, 318; typhoid-fever, 102; diarrhœal diseases, 145; cerebro-spinal meningitis, 37; whooping-cough,

27; measles, 14. Seven hundred and seventy-five, or 14.18 per cent, were caused by phthisis pulmonalis. Estimating population at 280,000 (233,959 in 1880), death-rate, 19 against 19.49 preceding year. Estimating Chinese population at 22,000, death-rate, 21 against 21.36 preceding year, and reducing the death-rate of other nationalities to 18.8 against 19.49 of the preceding year. The reduced number of deaths from zymotic diseases from 927 during the preceding year to 775, or only 14.46 per cent of the total mortality, is considered "an indubitable evidence of the improved sanitary condition of San Francisco. This improvement is due to the filling in of many ponds of stagnant water, always productive of miasmatic disease; the construction of many sewers, and the reconstruction of others, thus enabling us to compel the abandonment of a very large number of cesspools and sinks, and to force landlords to connect their house-drains directly with the sewers. The faithful and honest execution of our admirable plumbing and drainage laws is doing much toward the improvement of sanitary conditions." Yet there are some grave defects and deficiencies in the sewerage system in certain parts of the city, which the health officer urges as dangerous to the public health, requiring speedy correction. Suitable playgrounds are urged upon the attention of the municipal authorities as eminently necessary for the physical and moral well-being of the 74,079 school children and other minors of the city who have no suitable resort for the promotion of health or pleasure.

For the month of March deaths reported, 445; from diphtheria and croup, 20; typhoid-fever, 9; consumption, 86. Death-rate, 18.71.

CONNECTICUT.—Ninth Annual Report of the State Board of Health for the year ending November 1st, 1886, Registration Report for 1885, and Laws of the State Concerning the Public Health and Safety, make a volume of 615 pages. Under the head of General Report it gives an abstract of the proceedings of the meetings of the board, signed by all the members, and following this the "Health of Towns," abstracts from reports of correspondents elicited by a categorical "circular sent by the secretary to some prominent physician in every

town in the State." Responses were received from 145 and reports from 121 towns of the 167 in the State. From these and other correspondence the secretary gives a succinct abstract and summary of the progress of practical sanitation and the present status of the public health. "Twenty-two towns report typhoid-fever as increasing; 43 towns report typhoid-fever as diminishing; 56 towns report typhoid-fever only as occurring; 12 towns report malarial diseases as increasing; 53 towns report malarial diseases as diminishing; 56 towns report malarial diseases only as occurring."

There are special reports upon Etiology of the Malarial Diseases of South-western New England, Dr. R. W. Griswold; Pollution of Streams, James B. Olcott; Warming of Dwelling-Houses, Dr. G. Eliot; Analyses of One Hundred and Ten Well-waters in New Haven, Drs. H. E. Smith and W. E. Lockwood; Report on Epidemic of Dysentery in Waterbury, Dr. W. L. Barber; Small-pox in North Manchester, Dr. R. M. Griswold; Diphtheria in New Canaan, Dr. W. C. Brownson; Diphtheria a Filth Disease, Dr. N. E. Worden; Petroleum Products for Illuminating Purposes in their Relation to Diphtheria, Dr. G. H. Wilson; Abstracts from Report on Adulteration of Foods, Dr. A. J. Wolff; Report on Disinfection and Disinfectants—abstract of the Report of the Committee of American Public Health Association. Dr. Griswold's paper of forty-six pages on the Etiology of Malarial Diseases is a continuation of the same line of thought as his previous contributions to the same subject, in substance, that these diseases are *not* due to the emanations from vegetable matter in process of putrefaction, conditions supplied by stagnant water, marshes, etc., or impure drinking water, and are not, consequently, removable and preventable by drainage and pure water supply. He very thoroughly discusses the relations, positive and negative, of all these and other alleged causes from extensive literature. The *malarial bacillus* of recent discovery he thinks "will topple for a time, and finally tumble into obscurity," with no better support than the other theories he has demolished. His paper is, in short, iconoclastic in the extreme—the medical profession is still wholly at sea in the etiology of malarial diseases; they are yet to be accounted for, and means yet to be discovered for

their prevention. Mr. Olcott's paper on the Pollution of Streams urges more and continued attention to the subject—that ignorance of the practice by those who engage in it must be overcome by persistent educational effort by sanitary officers. Of the 110 water analyses of well-water collected in New Haven, by Drs. Smith and Lockwood, the conclusion is "that while there are some usable and even good wells in the city, the majority are to be regarded with suspicion, and not a few are quite unfit for use." Dr. Barber's report shows a close relation between several epidemics of dysentery and the frequent recurrence of typhoid-fever in Waterbury with ponds and streams polluted by the filthy soakage of cesspools and privy vaults. Dr. Worden shows that diphtheria, also, frequently exists in the same relations with filth as do typhoid-fever and dysentery, and that the same means are necessary for its prevention. The evidence of the relation of petroleum products to diphtheria and other affections of the throat adduced by Dr. Wilson shows that the use of petroleum oil for illuminating purposes in close rooms is a prolific means of contaminating the atmosphere, which is far from being sufficiently regarded; above all, when the effort is made to use it economically, or for lessening the light in rooms occupied by the sick, by turning down the lamp-wick so low as not to admit of as complete combustion as possible of the evolved gases; this is probably the whole source of the ill effects described. Report on Adulterated Foods, by Dr. Wolff, is chiefly devoted to and confirmatory of what has been shown heretofore on the most common adulterations of flour, tea, and coffee, and the excellency of Dr. Thomas Taylor's methods of detecting impurities in and of milk, butter, and cheese, with special reference to "oleomargarine," "butterine," etc. Report on Disinfection, etc., is an abstract from the report of the Committee of the American Public Health Association.

Of vital statistics: estimated population of the State, based upon the census of 1880 (622,700), 684,000; births, 15,496, 22.65 per 1000; marriages, 5091, 7.44 per 1000; deaths, 12,033, 682 more than preceding year, 17.59 per 1000. Deaths from zymotic diseases, 2382, 19.7 per cent (2 per cent less than for previous year) of the total mortality. From *measles*, 154, three times as many as in the preceding year; *scarlet-*

fever, 286, 78 more; *diphtheria* and *croup*, 499, 10 less; *whooping-cough*, 64—the smallest number of any year since 1881, and 2 per cent less than the average for ten years; *typhoid-fever*, 227, 54 less than in 1884. From *consumption*, 1492, 11.82 of total mortality.

For the month of March, 1887, the mortality and chief causes of death in nine cities were as follows:

Bridgeport, 59; zymotic diseases, 6; phthisis, 15; pneumonia, 5.

Hartford, 78; zymotic diseases, 10; phthisis, 14; pneumonia, 11; heart disease, 6.

Meriden, 29; zymotic diseases, 6; phthisis, 4; nervous diseases, 7.

Middletown, 31; zymotic diseases, —; phthisis, 4; pneumonia, 7; nervous diseases, 2; heart disease, 2.

New Britain, 29; zymotic diseases, 3; phthisis, 4; pneumonia, 3.

New Haven, 121; zymotic diseases, 11; phthisis, 16; pneumonia, 14; nervous diseases, 25; heart disease, 8.

New London, 19; zymotic diseases, 11; phthisis, 2; pneumonia, 1; nervous diseases, 2.

Norwalk, 28; phthisis, —; pneumonia, 5; heart disease, 1.

Norwich, 34; zymotic diseases, 4; phthisis, 4; nervous diseases, 7; heart disease, 5.

Waterbury has failed to report. The other cities, representing a population of 270,000, or about two fifths of the whole State, suffered a loss by death of 430, which is an annual death-rate of 19.1 per 1000 of the population. This is a marked increase over the death-rate during February, when it was 16.7.

In public institutions there were 10 deaths in New Haven, 11 in Hartford, and 7 in Middletown. Deducting these from the full number reported gives the following as the annual death-rate for the cities: New Haven, 18.1; Hartford, 17.1; Bridgeport, 17.7; Norwich, 17.3; Meriden, 15.8; New Britain, 20.7; Norwalk, 22.4; Middletown, 24; New London, 18.

Reports were received from every county in the State. Of epidemics, whooping-cough and measles were very general throughout the State, but with few exceptions of mild form.

DELAWARE.—*Wilmington* reports 101 deaths during the month of March in a population of 57,000, of which 37 were under five years of age. Death-rate per 1000, 21.26. From zymotic diseases there were 8 deaths, and from consumption, 21.

DISTRICT OF COLUMBIA, for the quarter ending March 31st: Deaths, 1062; from zymotic diseases, 108; typhoid-fever, 16; diphtheria and croup, 17; malarial-fever, 9; diarrhœal diseases, 10; scarlet-fever, 5; other zymotic diseases, 51. Consumption, 208—19.5 per cent of total mortality. Death-rate per 1000 (210,100) per annum, 20.23.

GEORGIA.—*Savannah* reports 105 deaths during the month of March in a population of 45,786, of which 34 were under five years of age. Death-rate per 1000, 30.45. From zymotic diseases there were 7 deaths, and from consumption, 18.

ILLINOIS.—*Chicago* reports 1518 deaths during the month of March in a population of 704,000, of which 803 were under five years of age. Death-rate per 1000, 24.45. From zymotic diseases there were 330 deaths, and from consumption, 137.

Rock Island reports for four weeks ending March 26th, 11 deaths in a population estimated at 13,655, of which 4 were under five years of age. Death-rate per 1000, 10.4. From zymotic diseases there were no deaths, and from consumption, 4. For the year ending April 19th, 1886: Deaths (for the year 1885), 159—decrease of 11 from preceding year; zymotic diseases, 30, of which 16 were from diphtheria and croup. Death-rate (13,000), 12.23. The menacing attitude of cholera was used with admirable effect in putting the city in sanitary condition. Every house was inspected, a thorough garbage-removal system inaugurated, surface refuse of every kind removed, privy vaults and cesspools emptied and disinfected. The commissioner now urges the importance of sewerage on some well-devised plan as absolutely essential for the maintenance of the public health.

LOUISIANA.—*New Orleans* reports for March 295 deaths in 176,500 white population; and 177 deaths in 66,250 colored population, making the respective death-rates 20.05 and 30.06

per 1000, and 23.33 for the whole population of 242,750. The deaths from zymotic diseases numbered 43, and from consumption, 63. There were 178 deaths under five years of age.

Quarantine regulations and appliances, as announced in the local press: "After June 1st vessels from suspected and infected ports will have to undergo a period of detention of five days, except those from points south of the equator, in which case the period of detention will be three days.

"The new quarantine disinfecting plant has been entirely completed, and is now in perfect working order. The appliances for treating ships, cargoes, baggage, etc., have been improved upon, and are without doubt among the most complete in the world. They allow a thorough cleansing and disinfection of a ship, without the slightest damage to cargo, effects, or passengers' baggage.

"In the event of a vessel arriving either at Port Eads or the Upper Quarantine Station with any contagious or infectious disease on board, or having had same during voyage, she will be immediately sent to the Lower Quarantine Station or Pass-a-l'Outre, there to undergo disinfection and such detention as the Board of Health may deem necessary.

"The quarantine rules and regulations will during the remainder of the year be enforced to the letter by the officers of the Board of Health, and every precaution necessary taken."

The Auxiliary Sanitary Association has earnestly entered upon its summer work. At the regular weekly meeting of April 21st, the president reported the receipt of $1915 of the $10,000 required for the season. "To enforce the necessity of cleanliness, public and private; to abolish, as has been done, pest spots by the thousand; to create and maintain sanitary works, and, by never-ceasing vigilance, to inculcate that this alone is the sure means of prevention, has been the chosen unpaid labor of a few citizens for the past eight years."

To say that the amount required will be speedily forthcoming, the spirited support hitherto given to this most praiseworthy work by the large-hearted people of New Orleans hitherto is a sufficient guarantee; for while, all things considered, New Orleans requires more assiduous attention to the protection of the public health than any other city in the Union, it may be truthfully said that the people of no other city have

so generously sustained the health authorities in both sentiment and material aid.

MARYLAND.—*Baltimore:* Health Department report for the fiscal year ending December 31st, 1886, is a document of 328 pages, consisting chiefly of statistical tables; these are introduced, first, by the Commissioner of Health, and all the rest by the heads of subordinate departments. The commissioner introduces the report by special reference to an exceptionally low death-rate (19.98) for the year, as shown by the mortality tables appended. The population, as estimated by police census, middle of August, was: white, 355,770; colored, 61,450: 417,220. Total mortality, white, 6477; colored, 1862: 8339. Death-rates, white, 18.19; colored, 30.52: 19.98; 3565 were of children under five years. Seventeen hundred and eighty-three, or 21.4 per cent, were caused by zymotic diseases, most numerously by diarrhœal diseases, 700; croup (128) and diphtheria, 318; typhoid (150) and typho-malarial-fevers, 208; measles, 201; whooping-cough, 91; entero-colitis, 54; malarial-fever, 47; scarlet-fever, 32; erysipelas, 32. Eleven hundred and eighty-two, or 14.17 per cent, of the deaths from all causes were by consumption.

Births, incompletely reported, 7691; marriages, 4108; still-births, 718.

The most notable advances in the health service are the better care of tenement-houses and plumbing. Privy wells and filth storage continue to disgrace the city and to require the most onerous work of the Department.

Reports for four weeks, ending March 26th, 592 deaths, of which 206 were under five years of age. Death-rate per 1000, 18.45. From zymotic diseases there were 46 deaths, and from consumption, 97.

MASSACHUSETTS.—*Boston*-Board of Health reports for the month of March, deaths, 835. Under five years of age, 249. From zymotic diseases, 84; diphtheria and croup, 30; measles, 10; typhoid-fever, 9; scarlatina, 6; phthisis, 126; pneumonia, 88; bronchitis, 50; heart disease, 66. Death-rate per 1000 (400,000), 25.0.

MICHIGAN.—Report for the month of March, 1887, compared with the preceding month, indicates that erysipelas,

measles, tonsillitis, and consumption of lungs increased in prevalence.

Compared with the average for the month of March in the nine years, 1879–87, measles and erysipelas were more prevalent, and remittent-fever, intermittent-fever, pneumonia, scarlet-fever, influenza, bronchitis, and diphtheria were less prevalent in March, 1887.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of March, 1887, at 46 places, scarlet-fever at 52 places, typhoid-fever at 13 places, and measles at 35 places. Reports from all sources show diphtheria reported at 12 places more, scarlet-fever at 10 places more, typhoid-fever at 3 places less, and measles at 11 places more in the month of March, 1887, than in the preceding month.

Compared with the preceding month the temperature in the month of March, 1887, was slightly higher, the absolute humidity and the day ozone were about the same, the relative humidity and the night ozone were less.

For the month of March, 1887, compared with the average of corresponding months for the nine years, 1879–87, the temperature was lower, the absolute humidity and the day ozone were about the same, the night ozone slightly less.

Detroit reports 303 deaths during the month of March, in a population of 180,000, of which 61 were under five years of age. Death-rate per 1000, 19.81. From zymotic diseases there were 64 deaths, and from consumption, 36.

Dr. Samuel P. Duffield, of Dearborn, Mich., has been elected Health Officer of Detroit, to succeed Dr. O. W. Wight, resigned. He has long been known as an analytical chemist of good repute, an industrious student of and essayist upon sanitary subjects, and for his contributions to the work of the State Board of Health (1877, '78, '79 and '80). Among the most important of his papers, "Well-Water as the Cause of Malarial Dysentery," "Ventilation of Sewers," "Contamination of Drinking Water," "Analysis of Alcoholic Liquors," and "Small-pox Epidemic in Dearborn Township," are of a character abundantly suggestive of the needful qualifications to succeed one so accomplished in the health service as his distinguished predecessor, Dr. Wight; and Detroit is to be con-

gratulated upon having made choice of a successor eminently deserving public confidence.

MINNESOTA *Bulletin* for March reports, infectious diseases : diphtheria, 20 cases, 3 deaths ; scarlatina, 22 cases, 0 deaths. Diseases of animals : Glanders, remaining on hand isolated or not accounted for at first of month, 32 ; reported during the month, 7 ; killed, 7 ; released, 15 ; isolated, 4. Remaining, April 1st, isolated or not accounted for, 17.

St. Paul reports 150 deaths during the month of March, in a population of 125,000, of which 74 were under five years of age. Death-rate per 1000, 14.40. From zymotic diseases there were 37 deaths, and from consumption, 14.

MISSOURI.—*St. Louis* reports 715 deaths during the month of March, in a population of 420,000, of which 247 were under five years of age. Death-rate per 1000, 20.4. From zymotic diseases there were 54 deaths, and from consumption, 73.

NEBRASKA has established a State Board of Health. The law provides that the Governor shall appoint seven persons, two from each Congressional District, and one at large, who, together with the Governor as their presiding officer, shall constitute the Board. Persons appointed must be graduated physicians of at least ten years' consecutive practice. The term of office is to be seven years.

NEW HAMPSHIRE.—*Manchester* Board of Health reports for 1886 : Deaths (excluding 46 still-born) 725, of which (as nearly as can be ascertained from the city clerk's nomenclature) 229 were caused by zymotic diseases : diphtheria and croup, and pseudo-membranous laryngitis, 21 ; typhoid-fever, 12 ; diarrhœal diseases, 137. Three hundred and thirteen were of children under five years of age. Excepting diphtheria and croup the city appears to have been remarkably free from infectious diseases common to children—not a single death from scarlet-fever. Death-rate (39,000) 18.43 per 1000. The prevailing nuisance is privy vaults. The city is reported to be well-sewered, but house connection with the sewers appears to be wholly a voluntary matter on the part of house-owners, a large

proportion of whom do not appreciate the necessity of it, and there is no law or ordinance to compel them—they are waiting for an epidemic.

NEW JERSEY.—*Hudson County* reports 485 deaths during the month of March, in a population of 258,000, of which 192 were under five years of age. Death-rate per 1000, 22.4. From zymotic diseases there were 49 deaths, and from consumption, 72.

Newark reports 331 deaths during the month of March, in a population of 161,778, of which 113 were under five years of age. Death-rate per 1000, 24.51. From zymotic diseases there were 36 deaths, and from consumption, 54.

NEW YORK.—The total reported mortality by State Board *Bulletin*, of 118 cities and towns, comprising 3,559,557 inhabitants, for the month of March is 7830 ; of which 32.5 per cent were under the age of five years. From zymotic diseases there were 1653 deaths, a ratio of 211.11 per 1000 total mortality. From diarrhœal diseases, the ratio per 1000 deaths is 79.83 ; from typhoid-fever, 9.20 ; from croup and diphtheria, 63.50. From consumption the ratio of mortality is 84.80 per 1000—the lowest ever noted in the *Bulletin ;* and 225.91 per 1000 above the age of five years. The combined death-ratio per 1000 from zymotic diseases, consumption, and puerperal diseases, is 309.00. From acute respiratory diseases there were 153.64 deaths per 1000 total mortality.

New York City, 1,481,920 : Deaths for the month, 3247 ; under five years, 1285 ; of zymotic diseases, per 1000, from all causes, 352.91. By croup and diphtheria, 285 ; typhoid-fever, 21 ; measles, 96 ; malarial diseases, 25 ; whooping-cough, 16 ; small-pox, 10 ; consumption, 486 ; acute respiratory diseases, 486. Death-rate, 26.15.

Brooklyn, 690,000 : Deaths, 1286 ; under five years, 450 ; of zymotic diseases, per 1000, from all causes, 138.63. By croup and diphtheria, 97 ; typhoid-fever, 5 ; malarial diseases, 11 ; whooping-cough, 10 ; scarlet-fever, 18 ; measles, 16 ; small-pox (including those who died in county hospital), 15 ; consumption, 180 ; acute respiratory diseases, 250. Death-rate, 22.37. The Annual Report of the Department of Health

of Brooklyn (vital statistics of which have already been published from advance sheets in our February number) urges the attention of the law-makers to the importance of so amending the plumbing laws as will authorize the Department to inspect and correct the plumbing which antedates the limitations regulating the plumbing to new buildings—those erected since the law went into effect in 1881. This is a very important matter. More than nine tenths of the plumbing in Brooklyn is dangerous to health. Revision of the sanitary code is also urged ; more power is required for the prompt application of sanitary measures, when orders of the Department are neglected, particularly with regard to the insufficiency of and defects in the water-closet accommodations in tenement-houses. The special reports, by subordinates of the Department, appended, show a large scope of well-organized sanitary work eminently creditable to the Department and its employés.

Buffalo, 202,000 : Deaths for four weeks, ending March 26th, 282 ; under five years of age, 108 ; from zymotic diseases, per 1000, from all causes, 142.85 ; croup and diphtheria, 17 ; typhoid-fever, 4 ; consumption, 27 ; acute respiratory diseases, 46. Death-rate, 18.07.

Rochester, 110,000 : Deaths, 168 ; under five years, 48 ; of zymotic diseases, per 1000, from all causes, 159.00. By croup and diphtheria, 17 ; typhoid-fever, 2 ; consumption, 30 ; acute respiratory diseases, 23. Death-rate, 18.35.

OHIO weekly health bulletin for four weeks, ending March 31st, reports from 50 counties : Cases of measles, 1099 ; diphtheria and croup, 154 ; scarlet-fever, 79 ; whooping-cough, 135 ; typhoid-fever, 11 ; typho-malarial-fever, 42 ; small-pox, 3. Compared with the preceding four weeks : measles increased 301 cases, whooping-cough, 72 ; scarlet-fever decreased 34, and diphtheria, 4.

At the quarterly meeting of the State Board, held in Columbus, April 20th–21st, the following resolution was adopted :

" *Whereas*, Complaints having been made to the State Board of Health that many lives are endangered on account of imperfect boilers, be it

" *Resolved*, The State Board of Health recommends that an inspection of all boilers be made, and that a copy of this reso-

lution be forwarded to the State Inspector of Workshops and Factories."

Dr. T. C. Hoover and Dr. S. P. Wise were authorized to arrange for a Sanitary Convention to be held in the south-eastern portion of the State.

Five thousand copies of a circular on the care and management of young children were ordered printed. The Board adjourned, to meet in Toledo, June 15th, 1887.

Cincinnati reports 468 deaths during the month of March, in a population of 325,000, of which 174 were under five years of age. Death-rate per 1000, 17.28. Deaths from zymotic diseases, 81; diphtheria and croup, 21; typhoid-fever, 21; measles, 6; from consumption, 68.

Cleveland reports 380 deaths during the month of March, in a population of 210,000, of which 147 were of children under five years of age. Seventy-seven were caused by zymotic diseases; measles, 18; diphtheria and croup, 16; consumption, 32. Death-rate per 1000 of population, 21.71.

Toledo reports 82 deaths during the month of March, in a population of 73,000, of which 20 were under five years of age. Death-rate per 1000, 13.48. From zymotic diseases there were 15 deaths, and from consumption, 13.

PENNSYLVANIA.—*Philadelphia* reports for four weeks, ending March 26th, 1756 deaths in a population estimated at 993,801, of which 624 were under five years of age. Death-rate per 1000, 23.0. From zymotic diseases there were 167 deaths, and from consumption, 255.

Pittsburg reports for four weeks, ending March 26th, 343 deaths, in a population estimated at 200,000, of which 159 were under five years of age. Death-rate per 1000, 21.2. From zymotic diseases there were 63 deaths, and from consumption, 33.

Erie reports 62 deaths during the month of March, in a population of 33,215, of which 22 were under five years of age. Death-rate per 1000, 22.3. From zymotic diseases there were 5 deaths, and from consumption, 9.

Reading report, for the year 1886, estimates the population, January 1st, 1887, at 52,250. Marriages, 583; births, 1566; deaths, 861. Death-rate (on estimated population at the end of the year) 16.4. Three hundred and ninety-one of the deaths

were of children under five years of age. One hundred and thirty-five, or 15.5 per cent of the total number, were caused by zymotic diseases : infantile diarrhœa, 44 ; croup and diphtheria, 38 ; typhoid-fever, 22 ; scarlet-fever, 16. One hundred and five, or 12.2 of the whole number, were caused by consumption. As compared with the previous year—death-rate, 20.2—there was great improvement, and 2.7 per 1000 less than the average for the last four years preceding.

RHODE ISLAND.—*Providence* reports 216 deaths during the month of March, in a population of 120,000, of which 73 were under five years of age. Death-rate per 1000, 21.33. From zymotic diseases there were 40 deaths, and from consumption, 29.

TENNESSEE *Bulletin* reports : "The principal diseases, named in the order of their greater prevalence in the State for March were pneumonia, malarial-fever, typhoid-fever, rheumatism, consumption, bronchitis, catarrhal-fever, tonsillitis, and cholera-morbus." Measles are reported in 40 counties ; whooping-cough in 19 ; mumps in 13 ; roseola and scarlet-fever in 6 each ; diphtheria and rotheln in 2 each, and meningitis in 1.

In the chief cities the respective death-rates per 1000 of population, annually, are reported as follows :

Chattanooga,	white,	18.60 ;	colored,	40.80 :	26.00
Clarksville,	"	12.00 ;	"	32.00 :	19.50
Columbia,	"	15.05 ;	"	51.64 :	31.05
Knoxville,	"	26.70 ;	"	46.36 :	31.08
Memphis,	"	17.90 ;	"	37.41 :	24.83
Nashville,	"	14.35 ;	"	28.88 :	19.60

The mean temperature for March was 49°, slightly above the normal. The highest temperature was 77°, recorded on the 1st and 26th, and was the lowest maximum reported in the five years beginning with 1883. The lowest temperature was 18°, recorded on the 29th, and was the highest minimum reported in the period above named, the lowest being 5°, reported in 1885. The mean daily range of temperature was very nearly normal.

The State was visited by three cold waves during the month ;

viz., on the 3d, 4th, 13th, 14th, and 27th and 28th—the predictions of which were all fully verified, the temperature reaching even 5° to 15° below the predictions.

The mean rainfall was 3.79 inches, slightly below the normal, and nearly two inches below the mean of the past five years in March.

The Eighth Annual Report of the Board of Health of the Taxing District of Shelby County (City of Memphis), for 1886, by G. B. Thornton, M.D., President of the Board, shows a continuance of the good results consequent upon practical sanitation. Total number of deaths for the year 1425—whites, 676; colored, 749. These numbers, based upon populations of whites 40,207, and colored 22,128, show the death-rates respectively, 16.81 and 33.89 : 22.86. The extent of the new sewerage system is now 39.38 miles, and still progressing. Street-paving and subsoil drainage are also progressing satisfactorily. The sanitation of Bayo Gayoso and its main branches, having long been used as open sewers, is now urged upon the attention of the district government as the next most important step. Late action looking to the improvement of the water-supply is commended, and early effective work hoped for.

TEXAS.—The recent reappointment of Dr. Robert Rutherford, of Houston, State Health Officer, is another gratifying evidence that sanitary knowledge is beginning to be recognized by the appointing powers. In our March number we took occasion to remark upon the Hon. Mayor of New York's appointment of Mr. J. C. Bayles, President of the Board of Health. The Governor of Texas' appointment of Dr. Rutherford to the same office which he filled with marked ability during the time of the epidemic of yellow-fever in New Orleans and Memphis, 1878 and 1879, is a no less signal recognition of competency as the first qualification requisite for efficient sanitary service.

VERMONT.—A State Board of Health has just been established in this State, making the twenty-ninth in the Union, numerically; but, unfortunately, in several States, while the Boards exist according to law, no appropriations are made to render them effective. It is sincerely to be hoped that the

progress made in the constitution of new organizations will have the effect of stimulating legislative action in Virginia and Georgia, and some others where excellent laws for the maintenance of the public health have been enacted without providing funds for their execution.

Burlington.—John H. Linsley, M.D., Health Officer, reports for 1886: Marriages, 121; births, 390; deaths (excluding 14 still-born) 248, with ratios to population (13,500) 1 to 55.78; 1 to 35.9; and 18.29 per 1000. Forty deaths were of children under five years of age. Fifty-three or 20.02 per cent were caused by zymotic diseases—diphtheria and croup, 21; cholera infantum, 19; whooping-cough, 3; puerperal fever, congenital syphilis and typhoid-fever, 2 each; bilious-fever, cholera-morbus, slow-fever, and alcoholism, 1 each. The proportion from zymotic diseases is the highest since 1880. Chiefly by the increased number from diphtheria and croup, and measurably accounted for by defective or deficient plumbing. Of 36 houses examined where these diseases existed, 2 only were found with proper plumbing. Fourteen without any house-drainage. It is gratifying to note that a plumbing ordinance has recently been enacted, by which it may be reasonably inferred the prevailing defects will be corrected. The water is said to be good, and no fault is found with the sewerage.

Report for the month of March: Deaths 16, of which 9 were under five years of age. Death-rate per 1000, 14.14. From zymotic diseases 4 deaths, and from consumption, 2.

VIRGINIA.—*Richmond* Board of Health reports for the year 1886: Births registered, 1983—white 196, colored 887; an increase of 35 white, and a decrease of 10 colored, from 1885. Still births, white 57, colored 101—a decrease of 4 white and 11 colored from 1885. These statistics being incomplete the Board urges an ordinance upon the City Council to compel physicians, midwives, and heads of families to report all births, with particulars required by the State laws. Marriages, 684—white, 382; colored, 302; an increase of 32 whites and 67 colored over 1885. Deaths 1787—white, 829; colored, 958—a decrease of 56 from preceding year, and the smallest number of any year since 1880. Death-rate per 1000 (100,000) 17.87; white (56,000), 14.80; colored (44,000), 21.77. Of the total

mortality 687—298 white and 389 colored—were of children under five years; 222 white and 129 colored; 19.4 per cent of the whole were caused by zymotic diseases; of which 61 were by diphtheria and croup; 27 typhoid-fever; 16 malarial-fever; 148 diarrhœal diseases: 12.8 per cent were caused by consumption.

Considerable progress in street-paving and sewerage is reported, but much still remains to be done to protect the people from the results of filthy soil soakage, and the consequent large ratio of mortality from filth diseases. Surface filth is bad under all circumstances, but under none worse than those in narrow, unpaved alley-ways, such as those pointed out in this report, with insufficient police to enforce city ordinances for the disposal of garbage and the prevention of out-throw. Richmond is so favorably situated with regard to sewerage, drainage, and civic cleanliness in general, it should rank among the most healthful places in the country.

WISCONSIN.—*Milwaukee* reports 265 deaths during the month of March, in a population of 180,000, of which 67 were under five years of age. Death-rate per 1000, 17.7. From zymotic diseases there were 29 deaths, and from consumption, 35.

VITAL STATISTICS OF IMMIGRATION AT THE PORT OF NEW YORK FOR APRIL, 1887.—(2) Belgenland, Antwerp, deaths 1, births 1, passengers 683; (3) Germanic, Liverpool, deaths 2, passengers 923; (3) City of Richmond, Liverpool, births 1, passengers 919; (3) Wieland, Hamburg, deaths 2, passengers 554; (5) Werra, Bremen, births 1, passengers 736; (6) Polaria, Hamburg, deaths 2, passengers 484; (8) England, Liverpool, deaths 1, passengers 743; (8) Noordland, Antwerp, deaths 2, births 1, passengers 1048; (8) Britannia, Marseilles, deaths 8, births 1, passengers 1018; (9) Adriatic, Liverpool, deaths 1, passengers 884; (9) Ems, Bremen, deaths 1, passengers 743; (11) Normandie, Havre, deaths 1, passengers 510; (11) Schiedam, Amsterdam, deaths 1, passengers 501; (11) Suevia, Hamburg, births 1, passengers 828; (13) Rhynland, Antwerp, deaths 1, passengers 472; (16) Britannic, Liverpool, births 1, passengers 1012; (16) Trave, Bremen, deaths 2, passengers 907; (18) Polynesia, Hamburg, deaths 1, births 1, passen-

gers 319 ; (18) Hekla, Copenhagen, deaths 1, passengers 913 ; (19) Fulda, Bremen, deaths 1, births 1, passengers 593 ; (19) City of Montreal, Liverpool, births 1, passengers 1303 ; (21) Westernland, Antwerp, deaths 1, passengers 1119 ; (23) Celtic, Liverpool, deaths 1, passengers 902 ; (24) La Bretagne, Havre, births 1, passengers 1078 ; (26) Circassia, Glasgow, deaths 1, passengers 868 ; (26) Elbe, Bremen, deaths 1, passengers 860 ; (27) Amalfi, Hamburg, deaths 2, passengers 298 ; (27) Italy, Liverpool, deaths 1, passengers 1399 ; (27) Alesia, Marseilles, deaths 2, passengers 1018 ; (28) Nevada, Liverpool, deaths 1, passengers 809 ; (28), California, Hamburg, deaths 1, passengers 341 ; (28) Pennland, Antwerp, births 1, passengers 642 ; (29) Wascholten, Rotterdam, deaths 1, passengers 665 ; (30) Aller, Bremen, deaths 1, births 1, passengers 965.

Total deaths, 41 ; births, 13 ; passengers, 27,157.

CANADA.—*Montreal:* Dr. Louis Laberge, Medical Health Officer's report for the year 1885, gives a description of the apparatus there used for incinerating *night soil,* which is said to have given entire satisfaction. The fecal matter is removed from the vaults by means of pneumatic excavators, conveyed to the deposit ground one mile from the city limits, and there completely destroyed by incineration, without causing the least inconvenience to the neighborhood. Diagrams of the apparatus are given, explaining its practicability.

Montreal has two magnificent abattoirs under the supervision of competent inspectors, who inspect all animals before they are slaughtered, and the meat afterward. No animals are allowed to be killed that are not perfectly healthy and at the least three months old ; and all meat found to be unfit for food, by being bruised or emaciated, is immediately confiscated and sent to the dead animal deposit ground, where it is utilized by the contractor for his own profit.

A history of the small-pox epidemic for the year is given, together with a record of vaccinations and the use of disinfectants in suppressing it.

The record of vital statistics for the year was : Marriages, 1495 ; births, 6,303 ; deaths, 7825, and the ratios per 1000 of population (167,501) respectively were 8.92. 37.62, and 46.71. The mortality from small-pox was 3164, 40.43 per cent of total ; diphtheria and croup, 479 ; diarrhœal diseases, 432 ;

measles, 142 ; typhoid-fever, 77 ; other fevers, 46 ; scarlatina, 42 ; cerebro-spinal meningitis, 31 ; erysipelas, 28 ; other zymotic diseases, 56. Many useful and practical suggestions are made with regard to unhealthful establishments and occupations, ventilation, etc.

INFECTIOUS DISEASES AND DEATH-RATES ABROAD.—From Surgeon-General Hamilton's weekly abstract of consular reports received through the Department of State, and from foreign correspondence direct, the following is a condensed statement of the most recent reports received since April 15th ultimo :

Cholera.—In South America : Montevideo, during the month of January, 82 deaths ; February, 57 ; number of cases not reported. Santiago, March 4th.—From the inception of the cholera epidemic, 2458 victims of the pestilence have occurred ; during the 24 hours last preceding, 27 new cases and 35 deaths ; cases now, 152. March 5th.—"Cholera diminishing ;" 59 cases yesterday, 34 deaths. And, *via* cablegram to a prominent business house at Lima : March 4th, 5.15 P.M., "Cholera rapidly decreasing at Santiago." Cases, 195. Valparaiso, March 4th.—Ten new cases and 6 deaths within the last 24 hours. Number of cases now, 35 ; 5.15 P.M. of same date, cablegram *via* Lima, "Cholera rapidly decreasing." Valparaiso, 39 cases ; provinces, 99. Quillota (between Santiago and Valparaiso), March 4th.—"Cholera has made its appearance here." Callao, March 6th.—Consul states : "There is as yet no appearance of cholera in Peru. Some cases have been reported on the eastern interior frontier of Bolivia, doubtless proceeding from the Argentine Republic. . . . Later advices, however, state that the reports alluded to are unfounded." Buenos Ayres.—During the month of January, 355 deaths ; number of cases not reported.

Catania, Sicily.—During the two weeks ending March 26th, 29 cases and 13 deaths, abating during the last four days of the period ; no new cases reported.

Calcutta.—During the two weeks ending March 19th deaths from cholera, 82 ; number of cases not reported.

Pesth.—The following items from the *Hamburger Nachrich-*

ten and *North German Allgemeine Zeitung* have been received from the United States Consul at Hamburg :

" In consequence of the suspicious death which yesterday occurred at Pesth, bacteriological examinations have been made, which have shown that the person in question really did die of Asiatic cholera. Yesterday a fresh case is said to have been discovered."

" Constantinople, March 29th.—In consequence of cases of cholera at Pesth, a quarantine of five days has been ordered for products coming from the Danube and the Black Sea from the mouth of the Soolina to Boorghas."

Small-pox.—Deaths reported from small-pox in foreign cities during the three months ending March 31st, 1887, as follows : London, 1 ; Glasgow, 1 ; Manchester, 6 ; Newcastle, 1 ; Paris, 59 ; Lyons, 1 ; Nantes, 1 ; Havre, 4 ; Rheims, 8 ; Amiens, 1 ; Besançon, 2 ; Brussels, 2 ; Anvers, 2 ; Liege, 1 ; Alost, 13 ; Marchiennes-au-Pont, 2 ; Tamise, 6 ; Ninove, 1 ; Hamburg, 2 ; Breslau, 1 ; Munich, 1 ; Vienna, 21 ; Pesth, 240 ; Prague, 46 ; Trieste, 8 ; St. Petersburg, 88 ; Warsaw, 104 ; Odessa, 1 ; Venice, 24 ; Bucharest, 3 ; Cairo, 14 ; Alexandria, 15 ; Port Said, 29 ; Suez, 4. During the three months ending January 31st, 1886 : Rome, 195 ; Milan, 114 ; Saragossa, 154 ; Turin, 7 ; Limoges, 1 ; Buenos Ayres, 27. Up to the most recent dates : During the two weeks ending April 16th : London, 1 ; Paris, 30 ; Havre, 1 ; Hamburg, 1 ; Anvers, 2 ; Alost, 1. During the two weeks ending April 9th : Vienna, 7 ; Pesth, 19 ; Prague, 10 ; Trieste, 4 ; St. Petersburg, 8 ; Warsaw, 18 ; Venice, 3. During the two weeks ending March 15th : Nice, 5. During the month of March : Kingston, Jamaica, 20.—During the three weeks ending March 31st : Guayaquil, 47.

Yellow-fever, Havana.—During the month of March, 8 ; two weeks ending April 23d, 10. Guayaquil : During the three weeks ending March 31st, 47. Acapulco : During the week ending April 17th, 1.

Vaccination in Africa.—Archdeacon Farrar, of Magila, writing from East Africa, says : " We have just saved the whole district of Magila from an invasion of small-pox, vaccinating everybody, at the rate of about fifty a day, until all have

been vaccinated ; so that, while other districts have suffered considerably around us, there has not been a single case of small-pox in the Magila district, with its hundreds of villages and thousands of people. This, of course, has commended our medical science to the people, and they come in numbers."

LITERARY NOTICES.

CHILD CULTURE.—The Fowler & Wells Co., 775 Broadway, New York, announce that the "American Kindergarten and Primary Teacher," which they have been publishing, under the editorship of Miss E. M. Coe, is to be discontinued. In its place, without any material change of plan, will be issued "Child Culture," which will be devoted to all phases of this subject, especially those relating to the best mental, moral, and social development of children from the period of infancy and youth. The price will remain the same, $1 per year, 10 cents per number.

THE HUMAN NATURE LIBRARY is announced by the same publishers, to be published in brochures of thirty-two pages each, illustrated, at stated intervals, at 10 cents a number.

THE SYNOPSIS OF PHRENOLOGY and chart also, by the same, is a pamphlet of thirty-two pages, containing the first principles of phrenology, together with directions for estimating the size of the faculties, descriptions of the temperaments and their influence in human character, name and functions of the organs, showing their degree of power. Illustrated by upward of twenty portraits and other engravings, and affords the reader a very good idea of the outlines of phrenology and its teachings.

THE CREMATION OF THE DEAD, by HUGO ERICHSEN, M.D., Honorary Member of the Cremation Society of Milan, Italy, is announced by D. O. Haynes & Co., Detroit, Mich. It will be ready in May. It will contain an introduction by Sir T. Spencer Wells, and will treat of the question from an Historical, Sanitary, Medico-Legal, Religious, Æsthetic, and Economical standpoint. Profusely illustrated. 8vo, cloth, $2.

A Practical Treatise on Obstetrics. Vol. III. (4 vols.), "The Pathology of Labor." By A. Charpentier M.D., Paris. Illustrated with lithographic plates and wood-engravings. This is also Vol. III. of the "Cyclopedia of Obstetrics and Gynecology" (12 vols.), issued monthly during 1887. Price of the set, $16.50. New York: William Wood & Company. Our remarks on the previous volumes of this comprehensive work are fully verified by the treatment of the special subject to which this volume is devoted. The anomalies in the uterine contractions and the abnormal results are subjects with which all practitioners should be sufficiently familiar never to be surprised by them, and in no other work with which we are acquainted are they so fully and clearly described as in this. The uses of ergot, its physiological and its pathological effects, are also herein fully described.

A Text-Book of Pathological Anatomy and Pathogenesis. By Ernst Ziegler. Translated and edited for English students by Donald Macalister, M.A., M.D. Three parts complete in one volume. 8°, 1118 pages, 289 illustrations. Price, extra muslin, $5.50; sheep, $6.50. New York: William Wood & Company. This is an eminently practical work, based upon the author's unusual experience and close observation, but with sufficient reference to the general literature of each subject discussed to make it a very comprehensive treatise and practically complete. "And," as the translator observes, "on some subjects, such as Malformations, Etiology of Tumors, and Bacteria, it gives a fuller account of modern teachings and discoveries than has yet appeared in any English manual." It is profusely illustrated with wood-cuts, among the most interesting of which is one of tubercle-bacilli, by Dr. Heneage Gibbes, of King's College, London.

Sewers, Ancient and Modern.—A paper read before the Cayuga County Historical Society, December 14th, 1886, with an appendix compiled from official sources of the Sewerage System of the City of Auburn, N. Y. By Cyrenus Wheeler, Jr., Mayor of Auburn, and a member of the Historical Society. Illustrated by Frank R. Rathburn. A pamphlet of forty pages and nearly as many full-page illus-

trations, descriptive of the sewerage of Auburn and amplifying the general subject of house drainage and sewerage, with an aptitude and perspicuity creditable alike to the accomplishments of the author and the assiduity which which he has used his accomplishments in the promotion of the most important interest of the city which has honored itself in honoring him. He has but just now retired at the end of his *third* term as Mayor. But with such a record of good works, it is reasonable to suppose that his retirement will not be of long continuance. If not, erelong, again elevated to the mayoralty, surely to some other office by which the city may continue to avail itself of rare knowledge in the right direction for the public weal.

COLLEGE BOAT-RACING is the subject of two particularly timely papers in view of the New London races, to appear in the June number of the *Century*. One, with illustrations, is by John Hanthone, famous on the Harvard crew of his day. The other is by a Yale man.

NERVOUSNESS: HEREDITY, SCHOOL PRESSURE AND WORRY. Annual Address by B. N. COMINGS, M.D., of New Britain, President of the Connecticut State Medical Society, 1885. Reprint from the proceedings. The nervousness here dealt with under different names is that which commonly begins, and is assiduously *taught* in school life, as the essential qualification for success in after years. It is, *par excellence*, New Englandism, and contagious as well as hereditary. Though more intensely prevalent in New England than elsewhere, it is easily recognizable all over the country by its puny progeny. Its systematic mode of production is well described by Dr. Comings in the address before us, which is eminently worthy of a wide distribution among a wholly different class of persons than those to whom it was addressed. Physicians are painfully familiar with the truths he so well states, and their best service consists in impressing them upon their patients.

SHOPPELL'S MODERN HOUSES is an illustrated folio of seventy-two pages, the January number of a quarterly publication by the Co-operative Building Plan Association, 191

Broadway, New York. Price $1. It contains an exterior frontispiece design, in colors; working plans and specifications; forty-nine designs for modern houses; axioms and rules of color; one design for a railroad station; four designs for stables and carriage houses; plumbing and draining; landscape gardening—planting; seaside cottage decoration, and habitations of man in all ages. The illustrations are excellent and the descriptions clear.

IMPURE ICE: *Report to the State Board of Health of New York on the Purity of Ice from Onondaga Lake, the Erie Canal at Syracuse, and from Cazenovia Lake*, by JAMES T. GARDENER, Consulting Engineer, verifies a good deal that has been published heretofore on the impurity of ice formed from impure water generally. The conclusion arrived at is "that water in freezing frees itself of only a part of the organic matter dissolved in it, and that *ice may contain from ten to eighty per cent of organic impurities in solution* in the water from which it was frozen."

Of the particular waters in question, the amount of impurities in Onondaga Lake and also in the Erie Canal at Syracuse, is so great that ice from these sources should not be used for any purposes where it is liable to come in contact with food or drink. But Cazenovia Lake water was found to contain less than half the amount of "free albuminoid ammonia" found in the canal, and only one third as much as that of Onondaga Lake; hence, "there does not appear sufficient evidence to condemn the use of ice from Cazenovia Lake."

THE TWENTY-SEVENTH ANNUAL REPORT OF THE MEDICAL SUPERINTENDENT OF THE STATE ASYLUM FOR INSANE CRIMINALS, AUBURN, N. Y., for the year ending September 30th, 1886, summarizes the movements of the asylum population during the year as follows:

Number of patients, October 1st, 1885,					
	males,	174;	females,	8 :	182
Admitted during the year,	"	70;	"	5 :	75
Whole number treated,	"	244;	"	13 :	257
Discharged during the year,	"	54;	"	2 :	56
Remaining September 30th, 1886,	"	190;	"	11 :	201
Average daily population,					194.30

Discharged recovered, males, 16; females, 1; improved, males, 4; unimproved, males, 26; females, 1; not insane, males, 4; died, males, 4: 56. Percentage of recoveries 6.60, of the whole number treated, and 8.74 of the daily average. Of the four deaths one was the result of strangulated hernia, one of pulmonary consumption, one of pneumonia, and one of exhaustion of mania. The death-rate being 1.55 per cent of the whole number treated, and 2.05 of the daily average.

The number admitted exceeds that of any previous year since the institution was opened, and the consequent overcrowding a continued source of embarrassment and anxiety.

Recent repairs and improvements appear to have included all necessary sanitary appliances except *more room* for the increased influx of patients.

Researches into the Etiology of Dengue, by J. W. McLauchlin, M.D., of Austin, Tex., reprinted from the *Journal of the American Medical Association*, is a pamphlet of twenty-three pages briefly descriptive of an unusually prevalent epidemic of dengue in Texas in 1885, when 16,000 cases occurred in Austin, out of a population of 20,000. The investigations appear to have been undertaken under the influence of a preconceived conception that the disease is due to a specific germ, and contagious; and the evidence adduced by subsequent observation and investigation—by microscopic examination of the blood obtained from living subjects during the various stages of the disease, from matters vomited and from the urine passed—though confessedly incomplete, appear to justify the view taken of the disease at the outset.

The Fourth Annual Report of the New York Skin and Cancer Hospital, for the year ending September 30th, 1886, presents a record that cannot be otherwise than eminently satisfactory to the projectors and patrons of this worthy charity. During the year there were treated in the institution 1415 new cases, 1276 of them out-patients, who made 6742 visits to the clinics. In the beds (of both the city and country branches), 165 patients, who were in the institution 8053 hospital days, of these, 5860 were entirely free. Cases of cancer treated and cared for 162; 36 received and nursed in the

country branch. Of skin diseases there were in the out-patient department 1245 cases, and these patients made 6131 visits to the hospital. There has been a steady increase in the number of patients relieved, and in the work done by the members of the staff.

THE TRANSACTIONS OF THE AMERICAN DERMATOLOGICAL ASSOCIATION, Greenwich, Conn., August 25th–27th, 1886, as presented by official report of the Secretary, G. H. Tilden, A.B., M.D., in a pamphlet of seventy pages, are of much practical interest to all medical practitioners. The opening address by the President, Edward Wigglesworth, M.D., admirably sums up the advantages of associated action by the special votaries of this branch of medicine ; and the cases related and discussions thereon which follow are well calculated to increase the membership.

THE MEDICINE AND HYGIENE OF THE TALMUD.—Dr. Carl H. von Klein, of 110 East Second Street, Dayton, Ohio, proposes to translate and publish from the *Talmud* everything relating to medicine and hygiene, providing that before undertaking the work he receives one thousand subscribers for the book. Such subscriptions, he says, may be addressed to him in the following words :

" I, the undersigned, agree to take one (or more) copy of the *Talmudic Medicine* of Dr. von Klein, which shall not exceed five dollars in cost for five hundred octavo pages, or at one dollar per each hundred pages, payable on delivery of the work."

Under no other circumstances, he says, will he undertake the work, which must be traced from " hundreds of thousands of copies," and which has heretofore not been accomplished by any living man. No more will be published than the number subscribed for, and fifty extra copies for distribution to the principal medical journals for review.—Dr. von Klein is well known to be exceptionally competent for this work, and every intelligent physician, as well as sanitarian, interested in the history of his profession, should subscribe without delay. If the work should not be undertaken for want of subscribers, there will, of course, be nothing to pay.

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THE SANITATION OF ALMS-HOUSES.*

By STEPHEN SMITH, M.D., State Commissioner in Lunacy, New York.

IN selecting the subject of "Sanitation in Alms-houses," it is proper to infer that the committee desired to have brought before the convention those conditions in these institutions, and in their management, which affect the health of the inmates unfavorably. The subject is certainly one of importance, and deserves the serious consideration of a body composed of gentlemen officially devoted to the care of the dependent poor. While there are alms-houses in this State which may fairly be regarded as meeting most of the requirements which sanitary science prescribes, yet it is painfully true that there are many others which are in the worst sense poor-houses.

In reviewing the topics which belong to the subject, it will be impossible to do more than to state the more general facts, with brief comments on them, as suggested by my personal experience.

The location of the poor-houses of the State is generally well adapted to secure health. For the most part they have elevated sites susceptible of good drainage. Few are built in the vicinity of malarial marshes. Buildings so located should have very dry foundations if the ground has been properly prepared. But it is too often a fact that the cellars of alms-houses are very damp, and many even have stagnant water in

* Read before the Sixteenth Annual Convention of the County Superintendents of the Poor of the State of New York, at Jamestown, N. Y., August 17th, 1886.

pools. Now, it is a well-settled fact in sanitary science that the first and essential requisite of a healthy house is a thoroughly dry foundation and cellar. A damp cellar makes a damp house, a damp house is the breeding-place of a great variety of invaliding diseases and of fatal forms of sickness. The older alms-houses partake, in this respect, of the character of the early homes of the settlers, who thought nothing ill of a damp cellar. In fact, among the early farming population a damp cellar, and especially a living spring in the cellar, was thought to be essential to the dairy-work of the household. And yet there is no doubt that many a laborious housewife, who spent much of her time at her dairy-work in the damp cellar, suffered from rheumatism, or died of consumption, Bright's disease of the kidneys, or a low form of fever, contracted in this unhealthy atmosphere. The dampness of the cellar always pervades the sleeping apartments of the house, which are comparatively warm, and hence induce the vapor of the cellar dampness to pervade them. This vapor of the cellar is peculiarly fatal to the health and even the life of the young and old. It is always charged with living organic germs which find a congenial soil in the lungs and throats of these peculiarly susceptible persons. If these germs do not induce active and fatal diseases, as diphtheria, typhoid-fever, etc., they lead to great vital depression and general enfeebleness of the body. That the air of the damp cellar is filled with organic germs we know by the formation of mildew on all moist surfaces of an animal character with which it comes in contact, as boots and shoes. The origin of these germs may not be the cellar, but they may have been derived from some neighboring collection of filth. Cellars are not more liable to be the receptacles of soil water than of soil air. The filthy air of a privy vault will find its way through the soil to a distant cellar even more readily than water, for it does not depend in its movements upon differences of level, but upon differences of temperature.

These very grave sanitary defects are susceptible of immediate and economical remedy. Though the foundations cannot be relaid they cannot only be made dry, but the entire cellar area may also be made thoroughly dry and healthful. Two things are necessary: (*a*) The surrounding soil water

must be completely shut off from the foundations. This can be effected by an intercepting external drain outside of the building, completely around the foundations, and sunk sufficiently below the walls to drain away all the surface and soil water which formerly passed through them into the cellar. This should be a stone drain, or tile, capable of receiving rapidly all the inflow of water. (*b*) Absolute dryness of the cellar bottom is to be secured by cementing the entire surface, properly underlaying the cement with a good foundation. By this means the foundations of an improperly constructed cellar may be made healthful. The Buffalo Insane Asylum affords a good example of the success of this kind of work.

2. Ascending from the cellar floor to the living apartments, we are impressed with the fact that, for the most part, the dormitories are also day rooms. In other words, the inmates occupy the same room day and night. This would not be so much of an evil if there was but a single bed in a large well-aired room. But, as a rule, we find the rooms crowded with beds to an excess that can but be detrimental to health to persons in health, and much more so to the ordinary inmates of alms-houses. A moment's examination of these rooms will convince any one that this custom of having a dormitory and day room common leads to an accumulation of filth and foul air quite destructive of health.

This evil can be remedied by reorganizing the several apartments, so as to have the dormitories entirely unoccupied during the day, and the day rooms entirely unoccupied at night. It may be alleged that there is such a deficiency of room that this change in existing poor-houses will be followed by overcrowding of the day rooms in the day, and the dormitories at night. But even this overcrowding of a room temporarily is much less injurious to health than the system of making dormitories of day rooms; for under the arrangement proposed, each room is unoccupied from eight to twelve hours of the twenty-four, during which it may be thoroughly ventilated and cleansed. During the period of occupation these rooms will never become nearly as unfit for habitation as under the present system of constant occupation.

If there is not adequate room for carrying out this reform, the necessary day rooms or dormitories should be added to the

building. These additions can be very inexpensively made, and will prove to be permanent improvements of great value.

3. Every one must be impressed, in visiting the ordinary alms-house, with the presence among other inmates of a number of filthy persons, who are imbeciles or paralytics. They are always very repulsive, and their habits tend to keep the rooms they occupy foul with the emanations from their clothing. Scattered as they are in different rooms, they do not receive the care and attention which their condition requires. In the arrangement of the alms-house this class ought to have an apartment for each sex set apart, and provided with a competent attendant, and every appliance and convenience necessary to the proper care of these unfortunate persons. Many of them are very old and are suffering from senile paralysis, and need skilled attendants to give them the care which they require. It would be much better, in every instance, to build a separate structure for the filthy, for the reason that they in time saturate the rooms which they occupy—floors, walls, and ceilings—with the emanations from their persons, so as to make them unfit residences afterward. The building erected for them could be so constructed that cleanliness could be maintained and healthfulness secured economically.

4. The need of a suitable hospital ward for those suffering from acute diseases, and an isolating ward for contagious and infectious diseases, cannot be doubted. In some alms-houses this provision is made, but too frequently the hospital is about the only room that cannot be utilized, and hence it is called the hospital, and is occasionally used as such. On the contrary, this ward should be selected with reference to the purity of the air, exposure to sunlight, freedom from sources of foul air, as privies, sinks, cesspools and sewers, and perfect quiet. The hospital ward should be a part of the original construction arrangement of the building, but failing in this, a room should be selected in the alms-house and be properly arranged.

5. The laundry and the kitchen are sources of filth and foul air in and about an institution which are rarely fully appreciated. When located in the basement of a building they rarely fail to keep the air of the several apartments well charged with their peculiar odors. These odors are but an insignificant portion of the volatile emanations from the various

articles being cooked, or from the foul clothing being washed. They are only what we take cognizance of by the single sense of smell. The amount and quality of what we do not take cognizance of can never be estimated ; but of this we are certain, that the volatile substances most dangerous to human health and life are not recognizable by the senses. Savory as may be the odor of a kitchen when a good dinner is being prepared, you have only to place a little of the deposit from the vapor upon a microscope slide, and examine it under that instrument after a few days, to discover that it abounds with living organisms, many of which are known to be injurious to human health when deposited on the throat. The walls of many a cellar kitchen are stricken with the same leprosy for the cure of which Moses directed that the stones should be taken down and cast into a pit without the city. If vapors arising from our food in the process of cooking may in time be dangerous to health if they reach and find lodgment in our living and sleeping rooms, what may we not anticipate if the vapors arising from the wearing apparel and soiled clothing of the inmates of an alms-house are allowed to pervade year after year the living and sleeping rooms of the institution? The kitchen gives us the emanations of substances which tend rapidly to putrefactive formation, but the laundry vaporizes and distributes through the dwelling the effete and decomposing products of waste, which the human system has already thrown off as poisonous. No air can be more dangerous to man, unless it contains the germs of specific infections and contagious diseases, than that laden with the débris of his own body. It is the vapors of the laundry that more thoroughly and rapidly disseminate the germs of scarlet-fever, small-pox, cholera, yellow-fever, than any known agency. The practical lesson which I wish to enforce is that the vapors of the kitchen should never be allowed to reach the living or sleeping rooms of human beings.

The remedy for this, like the remedy for most sanitary defects in our dwellings, is simple, effective, and economical. In the construction of the alms-house the kitchen should be placed in a well-ventilated wing, with provision in the chimney to carry the vapors into the upper air. The laundry should be located apart from the alms-house, in a building by itself.

In the old alms-houses the emanations from the range and laundry can be collected and carried away by a properly arranged hood. To these measures should always be added thorough ventilation, so arranged that vapors will be carried directly out of the room into the open air, as distant as possible from the windows of occupied apartments of the house.

6. The provision for the proper care and utilization of the waste of the house is one of the most common, and apparently most important sanitary defects of the alms-house. Necessary as it is to protect the air of the dwelling from defilement by privies, cesspools, and other collections of filth, some of the conditions already mentioned and which attract but little attention, are more dangerous to life and detrimental to health, than this. The principle underlying the proper care of the waste of a house is this—viz. : that this waste should be utilized, and that the very act of utilizing it renders it both innocuous and harmless. And it should be farther stated that the waste of a house is rarely injurious to health in its crude or fresh state, though it may be offensive. It is only when it is retained long enough under conditions which induce putrefaction that it becomes dangerous. It follows, therefore, that it is economy to utilize all the waste of the house, and it is in the interest of health that this utilization should be a constant process, and so organized that the waste is at once subjected to the necessary care. The waste to which I shall refer is the outflow of the kitchen and the closets. The materials of both are composed chiefly of organic matter, which is in a high degree fertilizing. The question arises, How can a system of immediate and constant care of waste be organized in our alms-houses to meet these economical and sanitary considerations? The machinery is very simple. If the works are to be constructed anew, as in a new alms-house about to be built, the arrangements for the flow of the waste of the kitchen and of the closets can be made into one receptacle at a proper distance from the house. This receptacle should be water-tight, either a tank or a well-cemented cistern, which acts the part of a settling basin. There is to be provided an overflow which allows the water, after the solid parts have fallen as sediment, to flow away. All the apparatus connected with this system is very simple, and easily constructed. With the exception of

removing the sediment from the cistern or settling basin to the compost heap, the entire system is automatic in its operation. So effectually does this method work that the presence of house waste water is unknown about the premises. This method has been in operation at Binghamton Asylum for several years, and not only are all of the asylum buildings entirely free from the odor of water-closets, and the kitchen of the foul odors of drains and slop sinks, but the value of this material thus prepared as a fertilizer has been of immense value to a farm suffering for the want of such fertilizing.

In old alms-houses where such construction work would not be undertaken as has been described, and they are by far the larger number, a more imperfect method must be adopted. Imperfect though the method is, it is nevertheless of great importance to adopt and enforce it in good faith.

I may add that in visiting old alms-houses, which have the old-fashioned back-yard privy, I have been astonished to find with what utter indifference this most disgusting source of foul air is considered. It has frequently happened on a summer's day to find the air of the whole area of the rear of the house almost suffocating with the nauseating emanations from the vaults of the closets. These vaults are too often located in close proximity to the building, are simply shallow pits dug in the loose earth, while the closet is an old structure, the wood of which is in an advanced stage of decay. This source of foul air may be so easily remedied that it is surprising that keepers of poor-houses are so reluctant to undertake to improve their condition. Like all the evils of poor-houses, they have so long existed that their real condition is not properly appreciated by those familiar with them. The remedy is simple, and may be readily applied in every alms-house. It consists in at once converting the materials of the vault into an odorless fertilizer. All that is required is to make a shallow vault, and cement it so as to retain all fluids. Into this vault should daily be thrown pulverized soil or ashes sufficient to entirely absorb all the fluid, and become thoroughly incorporated with the solids. Every day this mass should be removed from the vault, and deposited in a compost heap with the waste of the barn-yards. It is always possible to find two or three old reliable men to do this work if it is placed in their charge as a regular duty. When properly cared for in the

manner described, these closets may be located near the buildings and never give rise to foul air noticeable beyond the immediate vicinity of the vault. I could mention instances where vaults that were formerly so foul as to make the air offensive for the area of one hundred yards, were rendered so free from emanations that standing over them on a hot summer day no odor was noticeable. I have recently visited a poor-house where the closet was in a room immediately adjoining a day room occupied by twelve persons, the receptacles in this case being sheet-iron boxes which were removed, cleansed, and disinfected daily. There was no odor perceptible in or about the closet, no soiling of the wood-work, and the air of the room was apparently as pure as that in an open field.

7. Pure water is an element of daily consumption essential to health. The truth of this statement will appear when it is remembered that eighty-five per cent of the tissues of the body are water, and that every function of the body requires water for its healthy performance. By purity of water it must not be understood as implying that only the chemical constituents of water are to be found in it, for water may contain and often does contain many substances which are harmless, and even may be medicinal. This is true of all mineral waters. We refer, rather, to those ingredients in water which tend, by their action on the digestive organs, to interfere with the process of digestion, or, when absorbed into the system, poison the blood. These impurities are of a septic or putrefactive character, and are generally of vegetable origin. They largely consist of animal and vegetable matters, which are capable of taking on active growth when they find a suitable soil. Thus water may be rendered impure by the germs of diphtheria and typhoid and other low forms of fever. The source of impure water in alms-houses is the common open well. It is too often so located as to receive the drainage of surrounding sources of filth. It is almost impossible to preserve the water of the ordinary well from defilement, if located on the premises adjacent to the house and out-buildings. These wells have generally been constructed at the time of the erection of the house, when there was very little attention paid to the sanitary conditions of a home. It was then believed that few, if any, diseases arose from drinking water from wells, and a well of ordinary depth was believed to be supplied by distant sources.

Now it is demonstrated that a very large number of fatal diseases are due to the impurities of well-water, and that the average well derives much of its water, especially during the rainy seasons, from the surface immediately adjacent to it. The most violent outbreaks of typhoid-fever in this State have been traced to the old well of the village. Cholera has often decimated alms-houses through the agency of the well, the waters of which were poisoned by its germs. The folly of supposing that the well does not receive the drainage from the surface soils has recently been illustrated by chemical examination of the artesian wells of New York City, the waters of all of which were found more or less saturated with surface filth. The drinking-water of alms-houses should never be taken from wells on or adjacent to the grounds, but should be derived from springs or water-courses which lie above the level of human habitations. It is always possible to bring water from hillsides whose springs cannot be contaminated with the filth of man or animals.

Without cleanliness there can be no sound health. Personal cleanliness is the first law of health. While this fact is, I think, universally recognized by keepers of alms-houses, it is by no means efficiently practised. Two defects have been noticeable in the management of bathing: 1. It has not been practised sufficiently often. In most alms-houses, perhaps, bathing is required weekly, but in many it is ordered but once in two weeks. Now, the inmates of alms-houses are of a class of persons whose tissue waste is rapid, and yet the elimination of this waste from the system is very slowly and sluggishly performed. The skin is one of the chief organs of the human system in eliminating the waste products of the body. Millions of glands fill the skin, each of which performs a most important act in throwing out to the external world the débris of the animal economy. Each one of these glands has its duct, by which its material is thrown upon the surface; and the orifice is so small where it opens upon the skin that a particle of dust or a globule of oil will seal it up. In persons accustomed to sedentary habits, and who perspire but little, these ducts are far more liable to be obstructed than in the active, in whom perspiration is constantly going on, and hence the process of washing out or flushing the ducts is so regulated

that but comparatively few can become closed. Bathing for cleanliness with alms-house people is, therefore, of far greater importance than with any other class. As a rule, bathing ought to be practised at least every four days. The kind of bath which they require is the hot-water bath with soap. To get the full effects of such a bath, the water should be raised to a temperature of at least 105° F., and it would be better with the feeble to make it 110° F. to 120° F. After the person has been in the bath a few minutes, he should stand up and be well rubbed with soap, then again take the bath, in order to wash away all the filth which the soap has dissolved.

It must be remembered that a hot bath is in the end a cooling bath, and that in an hour or two after bathing old and feeble persons are liable to feel a sense of chilliness. They must, therefore, be protected after the bath by warm clothing in a warm room.

In bathing one water should be used to each patient. The practice prevails of bathing several persons—I have known it to be as many as nine—in a single bath. This is a most unhealthy and filthy practice.

Cleanliness of the clothing of patients is of course important, as also of beds and bedding, and need not be dwelt upon. Cleanliness of the rooms is far too little attended to, and on this account the air is often rendered very foul. This subject deserves the special consideration of keepers of alms-houses.

8. Pure air in our domiciles is the rare exception, though it is universally regarded as essential to health. It is undoubtedly true that the moment we begin to shut out of our dwellings the free external air, that moment we begin to supply ourselves with foul air. The sources of foul air in our public institutions occupied by the sick are so numerous that it will be desirable to mention only some of the more common and preventable. And, first, man himself poisons the air which he respires more fatally than any other source of foul air. Air which has once passed through our lungs has not only been deprived of all its vital properties so far as animal life is concerned, but it is heavily charged with gases which are deadly poisons to man. It follows that within a given time a man will destroy the air of his domicile, and render it fatal to life. Second, the emanations from filthy or filth-producing materials in our rooms render the air dangerous to life and detri-

mental to health, and wash-bowls having sewer connections, untrapped or poorly trapped, are the most dangerous. These sources of foul air are most active at night, when there is the least ventilation of the room, and are fruitful causes of ill health and fatal forms of sickness. Old and soiled clothing abounds in the sleeping rooms of the inmates of poor-houses.

Old people naturally have a great attachment for articles of clothing, and for household goods which they have long possessed. When they go to the poor-house they gather up all these articles as keepsakes, pack them in old trunks or boxes, and store them away around and under their beds, if allowed. It is no uncommon thing to find in poor-houses the beds of all the old inmates thus underlaid and surrounded. An examination of these packages reveals an astonishing amount of accumulated filth, the emanations from which render the air of these rooms, at all times, foul and unhealthy. The remedy for this evil is: set apart a proper room for the clothing and other articles which it is proper for the inmates to retain, and then require them to have all these articles properly placed in this store-room. It is alleged that old people are so attached to these articles that they are rendered very unhappy by being required to give them up. While this is doubtless true, it does not follow that they should be indulged in this feeling at the sacrifice of the healthfulness of their rooms. Moreover, there are poor-houses in this State where the plan mentioned has been thoroughly and satisfactorily enforced. The beds in these institutions are clean and free from filth as are those in a private house. The inmates have even come to prefer, on trial, keeping their household goods stored in a separate room, which they are permitted to visit from time to time.

The practice of smoking, in sleeping rooms, is another source of foul air very commonly met with in poor-houses. The filth and foul air by the use of tobacco, by paupers, where they use it habitually in their rooms, is of a most disgusting and nauseating character. The tobacco is generally kept loosely in boxes, or in papers stored in or under the bed. Their pipes are foul with long use, and the expectoration which smoking causes is carelessly discharged upon the floor and furniture, and even on the beds. If the practice of smoking is allowed—and there is no reason why it should not be to a moderate extent—a smoking-room should be set apart and ex-

pressly provided, separate and sufficiently apart from the dormitories.

There are also many sources of foul air outside of the building which contaminate the air within. 1. Practice of throwing the waste of the kitchen on the ground around the building is very common. This material undergoes rapid putrefaction, especially in summer seasons, and gives rise to volumes of foul air, which penetrate all the adjacent parts of the building. This disposition of waste of the kitchen, even though there are slop-basins or receptacles expressly arranged for its reception, is a defect that can be remedied by enforcing rigidly rules for cleanliness. The receptacle for this kind of house waste should be conveniently situated, and then the rule of depositing all in this receptacle should be rigidly enforced. 2. The location of the closets and their proper care have been already considered, and I will only add it is a subject of first importance in securing purity and wholesomeness of the air of the poor-house.

Food is the first essential to life as well as health. And yet food as a factor in the maintenance of health cannot be considered abstractly, but must be discussed in its relations to the physical condition of the individual. A table may be amply supplied with foods adapted to the healthy adult, and yet there may not be an article which the toothless infant could digest. The food of the adult is not adapted to the wants of the aged, nor is the food of the consumptive suitable altogether for the rheumatic. Again, food may be so changed in the method of cooking as, while preparing it for one class, it is spoiled for another. Finally, it may be so served that some persons cannot get the full benefit of it, as, for example, when meats are given in bulk to old people destitute of teeth. The practical lesson which I would enforce is this—viz. : the dietary of the poor-house should be occasionally supervised by a competent physician, as is the dietary of an hospital. In this supervision regard should be had, first, to the several classes of inmates, and, second, to the quality and preparation of foods. The inmates may readily be divided into two great classes—viz. : those under and those over sixty years of age. In these two classes the digestive organs are so different as to require, not only different foods, but also different methods

of preparation. In those under fifty we find usually the incisor teeth still strong and sharp, and capable of tearing the food, especially the meats, and the molars in such a state of preservation as to enable the person to masticate his food thoroughly. This act is half of good digestion. In persons over sixty, among the poor, the entire set of teeth are usually so impaired as to be useless for mastication. Either the teeth are gone altogether, or they have decayed so that there are few opposing teeth. This decay of the teeth indicates a change in the digestive organs throughout. They are again approaching by atrophy, or wasting, the condition of childhood. I speak of the age of sixty, not intending to fix that period arbitrarily as the dividing line in all cases. The period of senile decay varies much with families and nationalities, and even with individuals of the same family. Some persons have reached decrepitude at fifty years, and others show few signs of it at seventy years of age. As a general rule, the age of sixty marks the changes of the digestive organs distinctive of middle life and old age. Only a competent physician could make the classification here proposed.

These two classes should not only have separate dietaries, but they should have separate tables. Old people eating soft foods are always a source of annoyance to those eating solid foods ; and where the two classes dine together jealousies are liable to arise, and a disposition to overstep the limits set in the dietary.

The diet of those who can masticate well should be largely solid, and should embrace, in suitable quantities, two kinds of food, represented by the lean and the fat of meats. The lean goes to make muscle and the fat to make fuel for the warmth of the body. These distinctions run through the animal and vegetable kingdoms, and ordinarily the healthy man selects, according to his taste, rightly of the two. The diet of those who cannot masticate must contain the same varieties of food, but the fat, or food giving the greatest amount of fuel for warmth, should predominate.

In the preparation of these foods the method of cooking should vary. It must be understood that the object of cooking foods is to subject them to such a degree of heat as will enable the individual to crush them in his mouth and reduce

them to fine pulp, which the gastric juice can act upon efficiently. Ordinarily more cooking than this is injurious, as excessive heat tends to change the nutritious fluids of food into indigestible substances, and in other cases hardens soft and easily digested substances. For example, if a good beefsteak is thoroughly cooked, the juices are changed from most digestible fluids to an indigestible oil. Or if an egg, which, uncooked or slightly cooked, digests in an hour, is hard boiled, it will require five hours for the same stomach to digest it. The best of foods may, therefore, be spoiled in cooking.

For the second class foods should be so prepared that mastication is not a necessary act. Their foods should be liquids and soft solids. Meats should be hashed finely, vegetables crushed, and nutritious fluids liberally supplied. Of the latter, milk is the most important, and should never be wanting. For the very aged and feeble, even these foods should be either treated with digestines, like pepsin, before they are taken, or they may be given immediately after the meal. Stimulants are also often necessary with the old.

2. Clothing is an element in the bodily health and comfort of the individual which is rarely sufficiently considered in our climate. The variable temperature of the seasons makes flannel a very necessary article of underwear, especially with the young and old. It ought to be regarded as indispensable to this class at all seasons of the year. To meet properly the conditions of climate, the quality of flannel for underwear ought to be of three grades—viz. : 1. Gauze flannel for mid-summer wear ; 2. A heavier grade for fall and spring wear ; and 3. The heaviest grade for mid-winter wear. It may seem a matter of slight importance that we should thus change our under-clothes with the changing seasons, but there is no doubt that if we should adapt this article of clothing to the wants of our bodies, with the precision that nature adapts the growth and changes of the hair of animals and the feathers of birds to the temperature of the air in which they live, a large catalogue of diseases which swell the mortality returns would be reduced to a minimum, and some would disappear altogether. The outer garments are of far less importance, and are generally sufficiently supplied.

Heating, by the open fireplace, and ventilation by windows

and doors, have probably not been excelled as sanitary measures by any of the many modern contrivances. The stove in some form is generally used, and while it supplies sufficient warmth, it does not solve the other problem of ventilation. As yet the window and the door are the usual means of ingress and egress of air. Of course there is no adaptation of fresh air to the inmates of a room, and no adequate means of forcing out foul air. If the plan of having day rooms and dormitories separately were adopted, the rooms would be far better ventilated at all times, whatever system was in operation, as these rooms would necessarily be unoccupied much of the time. The common furnace in a damp cellar is probably the most ingenious contrivance for supplying a house with foul air yet devised. Though the furnace is ostensibly supplied with fresh air from the external atmosphere, yet the fact is that the principal part of the air is derived from the cellar itself. The heat of the furnace raises the temperature of the cellar above that of the surrounding soil, which of course creates an inflow of soil air from long distances. Added, then, to the foul damp air of the cellar are the gases from any neighboring source of filth. It is probable that the healthiest method of heating institutions of considerable size is by steam. The air of the room is never injured by contact with the source of heat, and the supply of air is from the surrounding atmosphere on a level with the rooms. Ventilation may still be by the common window or by flues in the walls adapted to that purpose. For large institutions the fan is indispensable. Whatever method of heating and ventilation is adopted, the important fact must be borne in mind that the physical condition of the inmates of alms-houses demands a uniformly high temperature. Attendants often complain that the patients always wish to have the room too much heated, and resist the admission of fresh air by opening windows and doors. This habit of patients is but the natural expression of their bodily condition. They are old and feeble, or infirm from disease, and their heat-making powers are weak. They must depend largely upon sources of external warmth to keep their bodies up to the normal standard temperature. The air of a room which to the middle-aged and vigorous is stifling with heat may be of only such temperature as will make a person of seventy-five

years of age comfortable. It is a maxim of sanitation that warm impure air is less dangerous to health than cold pure air. The average temperature of a ward occupied by the aged and infirm ought to vary little from 72° F., and that variation had better be upward rather than downward.

The high and tight board fences surrounding the exercise yards is a relic of the past to which many alms-house keepers cling with great tenacity. They are most serious drawbacks to the healthfulness of the institution, besides being very unsightly and very demoralizing to the inmates. I visited last week the alms-house of a wealthy county, located on a commanding elevation, which gives the observer a view of thirty miles of the most beautiful scenery in this State. From none of the windows occupied by the insane inmates could this magnificent panorama be seen except at night. I found all of the inmates, upward of one hundred, confined, on one of the brightest days of August, in two yards, surrounded by fences so high and tight that nothing could be seen but a limited space of clear sky overhead, from which the sun, unobstructed by any shade-tree, poured his fiercest rays into that overheated yard. The yard was not enlivened by even a blade of grass, but the soil had been trodden to the hardness of granite by the weary feet of the poor creatures who have for a decade wandered about their prison walls in the vain attempt to satisfy their longings to see the green fields, which within six inches of their feet stretched away in endless and ever varying beauty to the distant horizon. In the corner of the yard was the usual filthy privy, out of order, and filling the areas with its disgusting odors. Among the patients in these yards were many intelligent old residents, who fully appreciated their surroundings. The keeper of this poor-house is one of the most humane of men, but in spite of remonstrances he adheres tenaciously to this barbarous method of treating the chronic insane, believing that in no other way can they be kept under control.

This is but one of many experiences in visiting the insane departments of the alms-houses of the State. It is gratifying, however, to be able to state that we have reached a period in the treatment of the insane when it is evident that the high board fence must go. Within the last year several

superintendents have taken out every other board, and thus let into these stifling courts the pure meadow air, while a few keepers have demolished them altogether. In every instance where this has been done patients have expressed the most intense satisfaction, and have ceased to desire to escape.

There are other subjects of perhaps minor importance, and yet in themselves of sufficient interest to be brought forward for discussion here, but I forbear to trespass upon your time with farther suggestions.

There are many who will doubtless assent to much that I have said, but will answer that these reforms are impracticable. The superintendent is subject to the supervisors, who vote or withhold the money at their pleasure. While that is true, it is also true that supervisors are reasonable men, and will act rightly when the subject is properly presented to them. Many superintendents have made great improvements in the construction and management of the poor-house by properly forcing the reforms upon the attention of the supervisors. It is said that nothing succeeds like success. There are superintendents here to-day who have completely revolutionized their institutions within a few years by going forward and making improvements, and thus commending both their judgment and their work to the supervisors.

Although there are alms-house buildings in the State that it would be more economical to tear down altogether and build new buildings, yet there are many others in a condition of great dilapidation because they have not been properly and timely repaired, which can, with little expenditure of money, be put in a good sanitary state. I have seen several alms-houses thus transformed from almost uninhabitable structures into pleasant, healthful, and altogether suitable residences for the poor.

A question has frequently been raised, when the proposition of improving an alms-house has been brought forward, whether such institutions ought to be made decent homes, lest they prove too attractive to the able-bodied vagrant, and invite him to assume vagrancy for the purpose of securing a good domicile at the expense of the public alms. The question is based on the assumption that the alms-house is used as a home for able-bodied vagrants, which, indeed, is too often a fact. But

this use of the alms-house is a perversion of its purpose which ought no longer to be allowed in this State. The alms-house proper should be, as it is no doubt believed to be by the people, an institution which admits to its care and sustenance only those persons whom poverty overtakes because their bodily infirmities, whether from sickness or old age, deprive them of the physical means of self-support. The inmates should be those poor of every neighborhood whose chronic invalidism makes their daily care a public necessity. The alms-house would then be what it ought to be. an infirmary to which only the sick and destitute poor are admitted. For the able-bodied vagrant there should be a well-equipped work-house and farm in every county, where this class should be compelled to support themselves by suitable forms of labor.

With this understanding of the nature of the alms-house, which should be organized as and called the County Infirmary, we may affirm that too much cannot be done to make them comfortable homes for the inmates. We should supply these people with the conditions promotive of physical comfort and health, of which their infirmities and poverty have deprived them. The highest and best type of public charity is that which supplements the wants and needs of its recipient. It is "eyes to the blind" and "feet to the lame;" it "delivers the poor, and him that has none to help him."

THE HEALTH OF THE NEGROES IN THE SOUTH: THE GREAT MORTALITY AMONG THEM; THE CAUSES AND REMEDIES.

By Horace W. Conrad.

It is a fact known to physicians, though few of the masses are aware of it, that in this country the death-rate of the colored population is much greater than the death-rate of the white population. The mortality of the negro is often double, and always nearly double that of the whites.

Dr. H. B. Horlbeck, City Registrar of Charleston, S. C., says in his annual report for 1884 (referring to this difference): "It is to be noticed that these results have occurred since the

descendants of the African race have become free ; the systematic, painstaking care of the sick in families having no longer been under the control of their former masters, has resulted in a mortality, at least in cities, nearly double what it was in ante-bellum days." Dr. J. F. McFarland, Health Officer of Savannah, Ga., in his annual report for 1883 says : "The death-rate of the blacks and colored is large ; it is equally so in all cities of the South, where this race is congregated in large numbers, and is uncontrollable, very many of them dying in poverty and want without having applied for relief or medical treatment." The reasons given by Dr. H. B. Horlbeck I am loath to accept, but it is undeniably true that there has been a constant increase in the negro mortality since the negroes' manumission.

The regularity of his habits under the old régime gave him then an almost total immunity from sickness ; and the same regularity in living under the new condition of things would do likewise. Be that as it may, the fact now is that this great mortality exists, and the direct causes must be considered, and, if possible, the remedy or remedies applied. That the causes and remedies needed may be more clearly understood, it is well to note, firstly, the diseases which cause this excess of mortality. The excess is greatest in consumption and pneumonia. In Charleston, S. C., the number of deaths from consumption for 1882–85 were 830 colored to 244 white ; Memphis, Tenn., 471 colored to 322 white ; Savannah, Ga., 391 colored to 212 white ; Nashville, Tenn., 330 colored to 232 white. The mortality from pneumonia for the same period stands : Charleston, S. C., 219 colored to 85 white ; Memphis, Tenn., 262 colored to 159 white ; Savannah, Ga., 166 colored to 60 white ; Nashville, Tenn., 155 colored to 100 white. The difference is also excessive in heart diseases, dropsy, scrofula, venereal diseases, and, when prevalent, from small-pox. We will now endeavor to show some of the causes of this condition of affairs.

The City Registrar of Charleston, S. C., in his report for 1885, gives as the cause "the improvidence of the majority of the colored people." It is certainly not due to any innate lack of viability, as I shall hereafter endeavor to show, but is caused by the condition of their dwellings, their manner of

living and personal habits ; these embrace many minor causes, none of which are insignificant. The negroes in all large cities are usually banished to the worst part of the city : houses will not be rented to them in any other portion ; the houses they are compelled to occupy are often those which, on account of their unworthiness, have been abandoned by the whites, and which in many instances would be condemned as unsafe for occupancy by any competent judge ; houses with broken floors, plasterless walls, panes out of windows (I have actually seen negroes in this city living in rooms with windows containing only half a sash), broken weather-boarding, often leaky roofs, crevices on all sides, exposing the inmates to the wind, rain, snow, or sleet.

How could the liability to disease be otherwise with this condition of things ! This is no overdrawn picture, but what can be seen by any one who will seek it in any city in the Union.

Again, these squalid domiciles to which the negro is banished are often in a location that is in itself unhealthy. The poisonous miasm from some stagnant pond conveys disease to them with every breath ; their drinking-water is contaminated and poisoned by the proximity of cesspools, and often by the refuse and drainage from slaughter-houses, breweries, factories, stables, etc. These conditions, it may be said, do not apply in all cases—there are some negroes who, by exceptional intelligence and enterprise, escape them. But as a class there is scarcely an exception ; and that these conditions greatly magnify the mortality is beyond question.

A sick man living in a deep valley, deprived of sunshine and pure air, once prayed to Zeus to give him better health, and, it is recorded, Zeus told him that if he would move upon the hill-top his prayer would be granted. So it is with the negroes : as long as they do not occupy comfortable houses in healthful localities they will be like the sick man in the valley.

The negroes' manner of living is another cause. They always flock together (although in this they are not different from other nationalities), and it is no uncommon thing to find from six to ten persons to every room in their dwellings. While one class of negroes lives in such unhealthful buildings as those above described, another class has comfortable

dwellings, but goes to the opposite extreme by closing every crevice or opening whereby fresh air can enter, and as a result the atmosphere in some houses is almost as vitiated as was that of the terrible Black Hole of Calcutta.

To this fear of fresh air may be laid many deaths from pneumonia and consumption. The vitality of persons living in such rooms is depressed, and they are rendered doubly susceptible to the inroads of disease. Unscrupulous dealers are permited to vend decaying fish and vegetables, tainted meat and unsound fruit, to ignorant patrons, who, unaware of the danger in consuming such unwholesome food, purchase it on account of its cheapness. The result of this is an increased mortality.

Disease among a certain class of negroes is also augmented by indifference to personal cleanliness ; and still another cause is the indifference to medical treatment—"Many of them dying without having applied for relief or medical aid."

In Savannah, Ga., in 1885, 7 whites and 114 blacks died without having a physician in attendance ; in 1883, 6 whites and 145 blacks. Moreover, the fact should not be ignored that numbers of negroes are also the victims of empyricism and experiment. Some poor negroes are undoubtedly sacrificed for the benefit of science.

The causes now given, I think, account for the excess in the diseases most common to adults, with perhaps one exception—scrofula. This disease is more fatal to the negroes, and particularly to mulattoes, than to the whites. The death-rate in this disease in the colored, though not in itself so large, is from three to seven times greater than it is among the whites. Some of it is undoubtedly due to immorality. (The scope of this paper excludes the discussion of the question why scrofulous affections arising from immorality should be more severe in their action upon the negro than upon the white race.)

I believe, also, that the prevalence of scrofula among the negroes is promoted by the immense quantities of meat consumed by them, to the exclusion of a sufficient quantity of vegetable food. I am led to this conclusion for two reasons : firstly, so far as I have been able to ascertain, scrofula is rarely found among the native Africans, whose diet is purely vegetable ; seldom do they eat meat. Again, from a recent medi-

cal journal I learn that the Esquimaux, whose diet is exclusively meat, usually die between the ages of thirty and forty-five, and among them scrofula is exceedingly prevalent.

But the greatest disparity in the death-rates of the two races is in the number of deaths under five years. Here there is, indeed, in the negro race a woful "slaughter of the innocents." The death-rate of negro children is always more than double that of the white, and from that to even four times as great. The causes previously given all seem to exercise their greatest intensity upon infantile life both before and after birth; there are other causes also for this. I again quote from Dr. H. B. Horlbeck, Charleston, S. C., in his report for 1882: "The matter of a better administration of the midwifery practice among our colored population in this city has been earnestly discussed from time to time. . . . The subject is one of very great interest, and commends itself to every thoughtful mind as to the issue involved, where dense ignorance and incapacity have full sway over the most critical period of existence; short though the time may be, yet long enough to swell our yearly reports with still-births and trismus nascentium, and occasion often deadly peril to the child-bearer." This quotation embodies the chief cause of the fearful mortality among children. The reader will understand this the better by the statement of the fact that more than half of the deaths under five years among negro children is caused by trismus nascentium. To well-meaning but ignorant old women can be laid this "slaughter in hecatombs" of children. Unwholesome food also has much to do with the deaths of infants and children, especially in the summer. There is a woful need of training-schools to educate nurses, and similar institutions throughout the South. Skilled *female* physicians (colored) are peculiarly fitted for lessening this infant mortality.

There are some diseases in which the death-rate of whites is greater—scarlet-fever, diphtheria, croup, softening of the brain, and alcoholism. And in yellow-fever epidemics the negro death-rate is always much less than the white death-rate.

Let us now consider the movements necessary to mitigate this evil, and, if possible, suggest the right remedies. Dr. J. F. McFarland, of Savannah, to whom I have previously referred, reporting upon this "differential race death," says: "The

fact is deplorable, and *I regret not being able to offer any suggestion to remedy the same.*"

The causes as herein presented suggest the remedies in every case as an unavoidable sequence. But the changes suggested cannot be brought about in a day ; they must be the work of years ; and the work must begin in the schools. It is just as important to teach the child the way to health as it is to teach it the way to affluence. The evil under discussion is so great that every teacher in the South should be compelled, either by text-book or daily lectures, to inculcate the ways of right living. This great mortality from the causes stated is as great an evil to the negro race as intemperance is to the whole human race. The ministers from their pulpits should urge their flocks to abandon those things which cause this great mortality, and should instruct them to give more attention to their bodily welfare as a duty due alike to God and their neighbors. The newspapers, particularly those conducted by and in the interest of the colored people, should open the eyes of the negro to this evil. Some of our most intelligent men are not aware of its enormity, or that there is even an excess of mortality in the negro race.

While the negro has been struggling for an education, advancement, eminence, and affluence, he has ignored the importance of a sound body. He must secure comfortable houses ; he must be taught the relation of personal cleanliness to health, the necessity of ventilation—this cannot be too strongly insisted upon, for deficient ventilation is the indirect cause of a large part of the mortality among the negroes. He must be advised to get sound food, though he pay a little more for it, and that it is best not to confine himself too exclusively to a meat diet.

Intelligent colored physicians should be scattered all over the South, to drive out the army of quacks, conjurors, root-doctors, and voudooists, who, ignorant of the noxious properties of the drugs they handle, have been and are doing much to swell the mortality by the administration of their poisonous compounds. Colored physicians are peculiarly fitted for this work ; being of the race, they are better able to understand any idiosyncrasies or peculiarities ; and, again, they will always diagnose their cases with more certainty, and administer those remedies which they know will alleviate their sufferings, and

not empyrically or experimentally, as I know is done in many instances by white physicians in their practice among the negroes.

And now as a summary: the foremost remedies are the teaching of hygiene in all colored schools; the establishment of schools for educating nurses and midwives; intelligent colored physicians both male and female; wholesome food; comfortable houses, properly ventilated; personal cleanliness, and a rigid sanitary supervision by all city authorities.

This enormous mortality of the negro has been one of the strongest arguments used by those who believe the negro will cease to exist as a distinct race in this country. This is overthrown by the fact that the per cent of births among them is as much greater than the rate among the whites as the death-rate of the white race is less than that of the colored. The effect of this prolific birth-rate despite the great mortality can be very clearly seen by comparing the annual or decennial census returns from any Southern city or State.

Dr. G. B. Thornton, a distinguished physician of Memphis, Tenn., to whom I am indebted for some of the statistics of this paper, in a paper he read before the American Public Health Association at Indianapolis, in 1882, says: "The negro race as a political and social factor in this country is now undergoing a test of civilization it has never before had, and I think, by reason of its innate hardiness and natural imitative instincts, which will compensate to some degree for its mental deficiencies, will develop an adaptability in its changed status toward the white race, and insure it a vitality as a distinctive race, which many, some years ago, were unwilling to admit. In support of this I refer to the relative rate of increase as exhibited by the United States Census for the last decade. The per cent of increase for the total population from 1870 to 1880 was 30.08—white, 29.30; black, 34.67. To show the relative increase between the two races in the South, I take from the last official census the three Southern States —Tennessee, Alabama, and Mississippi—which may be accepted as a fair criterion for the rest of the South. Rate of increase in these taken as one State—white, 23.90; black, 33 per cent. It is still more apparent in South Carolina, because it is less affected by immigration from other States, and shows more accurately the natural increase. There it is 45.33 for the blacks, and for the white population, 35 per cent."

Another statement in regard to this phase of the subject, from the same paper, is: "That a preponderance of population in favor of the negro race will ever result except over some areas which are simply propitious for it, from natural climatic influences, is not probable. The addition to the white population from immigration is constant, while the flow of the negro population from country to city, where, for reasons already given, its increase being impeded will check its growth." Where the writer speaks of certain areas which from climatic influences are especially propitious, he has in mind, I think, the State of Mississippi; for in a paper written by him on the "Sanitation of the Mississippi Valley" (and for a copy of which I am indebted to him), he says: "All that extensive area known as the bottom lands of the Mississippi and its tributaries, the cotton country, perhaps the richest agricultural district of the same extent in the world, is more favorable to the negro than to the white race."

Statistics *taken with reference to the negro* show that more colored women than men become nonogenarians and centenarians; more females die than males, while with the whites it is *vice versa;* more single males than single females die; more married males than married females; more widows than widowers (it would seem from this that if a man is single or married he has a bad show, but if he is a widower his chance of life is materially increased; and the women are safe single, still safer married, but stand a poor show as widows. They doubtless have an instinctive knowledge of this fact, for they get married as soon as possible, and if Providence makes them widows, they endeavor to get back into the matrimonial chains as soon thereafter as possible); more females than males die of consumption; more males than females of pneumonia; more negroes come to their death from burns than from any other accident; few by suicide, and few from dementia. According to Dr. Pratt, of Kalamazoo, Mich., only one in 1037 negroes become insane, and one in every 434 whites.

I have endeavored to show the mortality of the negro from every possible view of the subject, and now, young men and women, you who are going out from here* to leaven the masses, remember that from many *remediable causes* your race

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is being weakened by disease, and wherever you are thrown, by precept and example, do all in your power to lessen this mortality. You who intend to be teachers, whether your school manual requires it or not, teach your pupils the laws of hygiene ; read them a chapter twice or thrice a week on that subject—*a subject which is truly of vital importance to the negro ;* even that will do much good in your community. Never in your rush for the good things of this world—for eminence, wealth, distinctions, or honors—forget the importance of *mens sana in corpore sano.*

In the following table is given the total death-rate per 1000, and also the death-rate under five years of age, in Charleston, S. C., Savannah, Ga., Nashville and Memphis, Tenn., for the years 1883–85. The upper figures give the white rate, the next the colored, and the third the aggregate :

	Charleston.	*Memphis.*	*Nashville.*	*Savannah.*
1883.	21.60	15.19	18.68	20.47
	47.13	35.83	31.29	39.57
	34.92	22.50	23.50	30.02
1884.	23.68	18.80	16.77	19.54
	44.63	41.66	26.94	42.21
	34.55	26.90	21.94	30.82
1885.	17.64	16.56	14.69	12.9
	38.49	36.96	27.07	34.4
	28.88	23.80	19.10	23.65

Rate of deaths under five years.

	Charleston.	*Memphis.*	*Nashville.*	*Savannah.*
1883.	5.88	3.75	5.65	7.59
	21.03	13.91	12.44	18.01
	13.45	8.83	9.04	12.80
1884.	6.48	4.47	5.46	6.54
	16.52	15.63	11.55	16.68
	11.50	10.05	8.50	11.61
1885.	4.45	4.67	4.37	4.23
	14.38	13.46	10.78	13.70
	9.41	9.06	7.57	8.96

THE RELATION BETWEEN DRINKING-WATER AND TYPHOID-FEVER.*

By Dr. Dowling Benjamin, Camden, N. J.

Typhoid-fever is caused by a peculiar and specific poison. I do not know that this is denied to-day by any one competent, from careful study and thorough investigation, to give trustworthy information on this subject. Does it arise *de novo?* All the investigations that I have made have proven to my mind that the poison which produces typhoid-fever cannot be generated spontaneously, but must come from another case. I am aware that there are some physicians who even now believe that it originates *de novo*, and they give the examples and cases which prove to their minds the truth of such belief. But the cases cited as proofs, in my opinion, are generally defective, and do not exclude the possibility of infection from a preceding case.

Take, for example, the four instances given by Dr. R. W. Hutchinson, of Queens County, N. Y., published so late as October 9th, 1886, in the *Medical and Surgical Reporter*. I will not occupy your time by criticising all these cases, but will select the fourth, which seems to be the strongest, as follows:

"4. In the last part of August, 1885, a party of young folks, numbering some fifteen, started out to spend the day on the banks of a creek near East Rockaway. They carried no water with them, but relied on securing a supply from a sunken barrel near the creek that had been used for that purpose for a number of years. On this occasion it was noticed that the water tasted and smelled badly, so much so that some of the party refused to drink it. Exactly one week from the day of the picnic most of those who had drunk the water, some nine in number, were stricken down abruptly with typhoid-fever. I regret very much that I did not have the opportunity of examining the barrel with its contents imme-

* Read before the New Jersey Sanitary Association, November 20th, 1886.

diately after the picnic, as I am now left in doubt as to the cause of the decomposition in the water. Shortly after the outbreak of the fever some person, fearing that others might drink, pulled up the barrel and destroyed the well. But, from a number of reasons, I can positively say that there was no possibility of the water being contaminated with the fecal matter of a patient suffering from typhoid-fever, which is the recognized way of communicating the disease; and if the germs of the disease did not originate *de novo* in the well-water, I ask the question, Where did it come from?"

You see the doctor gives no reasons why the well could not be contaminated with typhoid-fever, though he says he has a number of them; yet he says he had no opportunity of examining the barrel nor its contents, but he HEARD some of the party say that the water tasted and smelled badly. Notice that in less than seven days most of the party of nine who drank of the water were suddenly stricken down. This fact in itself might occasion some doubt of the fever being a true typhoid, as the incubation period of typhoid-fever is usually longer, though there are instances on record which would have a tendency to show that typhoid-fever may occur with a shorter incubation period than two weeks. Two weeks, however, is about the usual time.

What a blessing it might have been if the doctor had only told us the precious little secret of how he knew that no one had been in that vicinity whose fecal matter might have affected the well!

Then, take the cases cited by the illustrious Murchison, who has done so much for the thermometry of typhoid-fever, but who has, perhaps, led astray more students on the origin of the poison than any other man. None of his cases are, in my opinion, conclusive, and this opinion is sustained also by the opinion of Dr. J. H. Hutchinson, of Pennsylvania, who says in an article on this subject that the cases referred to are by no means convincing. (See p. 256, "System of Medicine by American Authors," just published.)

The case put forward by the advocates of the spontaneous origin theory as one of their strongest, is that reported by R. Bruce Lowe, Medical Officer of Health, Helmsley, Yorkshire, published in the *British Medical Journal* in 1880. "It occurred," he says, "in a lad who had not been away from

home for months. No stranger had visited the house, and there was no fever in the district;" but Mr. Lowe admits there was a case before, only eight months past, and only eight miles distant, and he does not prove there was no possibility of infection, either by domestic animals or by streams of water. It is a well-known fact that when the great forests of pine are cut off the land in the northern part of the United States, there comes up a thick growth of oak timber, immediately succeeding, and the common opinion of people who notice this strange phenomenon is that the little oak plants originate spontaneously in the soil. I think you will hardly believe this explanation correct, but the same agencies that sowed the original seeds in the forest, it must be admitted, are equally competent to sow the seeds of typhoid-fever in unexpected places, occasionally at least. The man who starts out in this stage of opinion to prove that typhoid-fever originates *de novo* assumes a greater task than Hercules.

No combination, either of filth, fecal matter, or sewer gas, has ever yet been discovered that will produce the disease.

What are the physical characteristics of the virus of typhoid-fever? Is this virus a liquid, a solid, or a gas? Evidently it is matter of some kind. Inorganic matter may be either solid, liquid, or gas; organized matter is never liquid, never gas. We conclude it is not a gas for the following reasons: First, the gas has not been isolated; second, it would be more apt to go through the air than otherwise—which is not the case with this virus; third. all known gases that affect the system profoundly, or that affect the system at all, do so at once, or in a few minutes after their reception into the system.

Can a dose of carbonic gas, ammonia gas, illuminating gas, or any other poisonous gas be taken, and lie in the system for from two to six weeks, and then begin to develop a train of trouble—a uniform succession of symptoms, like typhoid-fever, or small-pox, or any other of the zymotic diseases? Never. Is it a liquid—this virus? The same objections apply to this theory of its being gas. Is it composed of solid particles? If so these particles must be of nearly the same specific gravity as water. There is no evidence to the contrary, at any rate, and these solid particles must be very small, for water known to contain typhoid-fever poison is often apparently clear and bright. Filters do not seem capable of

sieving out these particles—these poisonous particles and this poisonous matter. At least, water has been filtered through ten and even one hundred feet of sand and earth, coming out clear, but still bearing the poison in sufficient quantities to produce fever and cause death. So far as is at present known, the poison has not been filtered out of the water by any kind of filter. This would lead us to think it was really dissolved in the water, but for the fact that a system of very fine filtration has not been tried upon suspected water, and then the water given to persons to drink, to see if the disease would be produced by it. There is no case on record of any person ever having taken the disease from water that has been boiled, thus showing that, as far as known, the boiling temperature destroys the poison.

The theory that the poison of typhoid is an organized poison, or germ, or bacillus seems to explain its action more completely than any other.* This phase of the subject was carefully discussed and its progress given at length by me in an essay written in 1876, and published in the *Country Practitioner,* Vol. II., Nos. 6 and 7. Whatever may be considered the nature of this virus, the fact that water is its principal distributor is certain. Indeed, a careful study of the cases and statistics that I have examined seem conclusive that at least ninety-five per cent of the cases of typhoid-fever come directly from the water. The poison which produces this disease does not go through the air. Physicians permit people to go into the sick-room where the disease exists. Washerwomen have been known, in rare instances, to take the disease from the water containing the soiled linen, which has infected their hands and gotten into their mouths and absorbents.

The infected wash-water is very often thrown on the ground near a well or into a sewer with the more poisonous dejecta. I have seen two cases that occurred among sailors who drank water from the Delaware River opposite the Philadelphia sewers.

There is one instance † where it has also been shown that cattle have been afflicted with this disease, but in tracing the disease still further back it was found that the cattle caught

* Klebs and Eberth both claim to have discovered the bacillus.—*Philadelphia Medical Times, December* 3d, 1881.

† Kloten, Germany, 1878; Berlin, *Klin. Wochenschrift.*

the disease from drinking infected water. The milk supply has also been known to have been affected. So the more we investigate the subject the more strikingly the fact stands out that water is the main *habitat* of the poison. Several facts show also that when water contains a little organic matter the virus will be active for at least a year in still water, and very probably for a number of years, as some of the cases cited prove.

The ways in which a well, or a spring, or a stream may become infected are so numerous and hard to trace that sometimes they defy detection. For instance, a man may leave the city where typhoid prevails more or less at the time, and be either in the first stage of the disease in a slight form, or convalescing, or be a walking case, perhaps not even knowing what is the matter with himself, getting out of his carriage or a railway car, taking his gun for a few hours' recreation, and, as it so often happens, is seized with a desire for evacuation. This may take place in the vicinity of a spring or stream of water, whence will thus start up one or more cases of typhoid-fever, and the manner in which the water became infected will never be known—will forever remain in doubt and a mystery. Even the presence in that locality of this person may never become known, or they may have known of the presence of such a person, and may have forgotten it. Recent investigations show the intimate relations of this disease to drinking-water to be so close and so constant that it is hardly ever worth while to think of any other source of contagion. One of the most remarkably clear examples of this relation of drinking-water to typhoid-fever occurred last year at Plymouth, a small city in Luzerne County, Pa., and for the invaluable lessons taught by this epidemic we owe much to the committee sent by the Mayor of Philadelphia to investigate the subject.

I quote from the report of the committee as follows :

" The mountain stream is a small one, running down over a rocky bed, and on a declivity not eighty feet from its bed a dwelling is situated, wherein, during January, February, and March, was located a case of typhoid-fever that is only now convalescent, the worst period of the case being about March 30th. The attending nurse was in the habit during each night of carrying the excreta from the patient and depositing it on the ground toward the stream. The ground during all this

time was frozen and covered with snow, until the thaw and rain already alluded to occurred. The poisonous character of the dejecta is not destroyed by freezing, but is only kept in a state of hibernation. A great part of the three months' accumulation of dejecta was suddenly swept into the rapidly-running stream, and reached the lower reservoir as quickly as a man walking fast would have arrived there.

"In fifteen days from this time the epidemic began, fifty cases occurring daily between the 10th and 20th of April. Up to the present twelve hundred people have been sick, and one hundred have died, out of a population of eight thousand. For the first three weeks the few people in the town who used well-water exclusively escaped the disease. The period of incubation varies from ten to twenty days, or longer, and therefore no other conclusion can be arrived at than that the infective poison existed in the mountain-stream water, and originated from the one case of fever in the house on the side of the stream."

This entire and comprehensive report is on file in the Mayor's Office, Philadelphia.

Last October a severe epidemic of typhoid was in progress in Imlaystown, N. J., about forty miles from Camden, and I went out there to investigate it, and was greatly assisted in so doing by the kindness of Dr. H. G. Norton.

I found that a brook about four feet wide runs through the village. A street runs parallel with the stream, about one hundred feet from it. A row of houses is situated between the brook and the street, and the back yards extend to the brook, about forty feet distant. Between the brook and the houses is situated a row of privies and a row of wells for drinking-water. The privies are situated on the bank of the brook, so that the fecal matter from them has run into the brook, a distance of only about four feet. The wells are between the stream and the dwelling-houses, and about thirty or forty feet from the brook. The somewhat impervious strata has a slight dip toward the wells, and underlies the locality. On measuring it was found that the floor or the bottoms of the wells was not more than a few inches below the floor of the brook, and when the water was high in the brook it was also high in the wells. The soil was porous between the brook and the wells of the privies.

Beginning up-stream and designating the houses, which are but a few feet apart, not over fifty feet, and numbering them "one," "two," "three," I will give you the following explanation :

In 1883 a family came to No. 1 suffering with typhoid-malarial-fever and diarrhœa. The children had fever and bowel trouble, with diarrhœa, lasting for months, until the spring of 1885. On August 4th, 1885, a young lady was taken with typhoid-fever in this same house. On August 28th another young lady was taken with the disease in No. 2, the next house below, down the stream. August 27th a patient at No. 3 took the disease. September 12th another patient took the disease in No. 3. In September a relative of the family in No. 2 visited the town, drank the water, and died in a few weeks afterward of typhoid-fever. September 30th a patient opposite to No. 2 took the disease. In the spring of 1886 the family had moved out of No. 2, the well had been kept closed and had not been cleaned out. A new family moved in No. 2 in April or May, 1886. The boys drank the well-water in spite of protests, and took the disease in June, 1886. One of the brothers died. The girls, who would not drink the well-water, escaped the disease.

An analysis of this water from the wells, for the State Board of Health, by Professor H. B. Cornwall, of Princeton College, showed the water to be thoroughly contaminated with fecal matter. Evidently the virus had remained in one of these wells ; a year had passed, and yet the winter had not been able to kill it.

The length of time that the virus will remain active has not been ascertained, but it is known to be years in water that is not much disturbed.

I have cited these examples because they are so recent and so near at hand. Hundreds of instances might be cited, and the evidences piled up *ad libitum*, but if further examples would not be superfluous in this paper, the time allotted to me would preclude my citing them here. I might say now that much of the data upon which my remarks have been based is not included in this paper for the same reasons.

In the face of what is already known, I do not think that any student of sanitary science can deny that the poison of

typhoid may be carried by the water-supply. I do not know that any do deny this, but the EXTENT to which it is carried by water, and the preventability of the same, are the great points that do not seem to be sufficiently appreciated by us, and scarcely appreciated at all by the people in general.

If the people can be made to understand that almost all the cases of typhoid-fever come from the water-supply, and that there is no disease more easily prevented than this, we shall have accomplished the first great step toward the annihilation of one of the worst destroyers of mankind.

Look at the dreadful suffering caused in Philadelphia and Camden to-day by ignorance or indifference to these facts. Only a few days ago a noble wife and mother died in our city of this dread disease, thus blighting the prospects of a happy family, and as I stood by her bedside I could but regret that another valuable life had been needlessly sacrificed. The husband of this lady—"as a lamb, dumb before its shearers"—opened not his mouth, but he paid his water tax to the city, his wife drank the dearly-bought "distilment," and gave up her life as the result.

The city of Camden had connected the water-closets and sewers containing the poison with the water-supply, and then distributed it thus laden with the deadly virus to the inhabitants of this city, but a few hours after it had left the sewers.

Is there no redress, is there no hope of escape for the people in these great cities? Must they continue to die by hundreds, as the death returns show every year, at a greater cost and expense than pure water could be procured for? Philadelphia also pours the poison into the cup, and then puts it to the lips of her most choice citizens, and kills off about seven hundred of them in a year, according to the official report.

The disease cannot occur without the virus to produce it, and the virus can be kept out of the drinking-water, and it should be kept out at any cost. It would pay at ANY price. Every death that is preventable is needless, and is a reproach to the community. Dr. E. O. Shakespeare, an eminent investigator of contagious diseases, who has been sent abroad by the highest executive authority of the United States to investigate the nature and causes of cholera, says, in the New York *Medical Journal*, in January, 1885, "that epidemics of typhoid-fever are absolutely preventable and controllable, and

neglect to employ proper means to this end should be regarded as inexcusable."

Great reforms and revolutions have taken place within our own recollection, and the student of sanitary science even dares to indulge the hope that even during his short life he may have the pleasure of seeing the death-rate from typhoid-fever reduced more than ninety per cent.

HYDRAULIC ENGINEERING.

MAN, lord of the solid earth, must very early have found that the world of waters could also be controlled to his service and utilized to his profit. He would observe that the rivers which ran through the broad plains in which he pastured his cattle and passed his nomad existence formed ways of transit more easy and cheaper than the employment of cattle or dependence on his own pedestrian powers. To those who made their settlements near the sea-shore, the ocean, with its ever-falling and rising tides, would naturally suggest similar ideas, but of wider scope, and lead adventurous spirits to put forth on its restless bosom in a hollowed tree-trunk or fragile coracle in order to find whither fortune would lead them. In all cases, man would soon learn that the common proverb relative to fire, which states that it is a "good servant, but a bad master," was quite as applicable to the rival element. Therefore we need not be surprised to find that very early in the history of humanity man made tentative experiments in hydraulic engineering—principally in what may be considered its "civil" branch—such as embanking land from the sea where old Father Neptune made fierce inroads on Mother Tellus, raising breakwaters and moles to protect harbors, forming canals, lakes, reservoirs, conduits, and rock cisterns for purpose of transit or irrigation where required. Some very ancient works in all these departments were of the most extensive and even gigantic kind. All through the Middle Ages works of engineering of a marine or fluviatile character were constructed over Europe. The foundations of that wondrous and beautiful marine city—Venice—where, as the poet Rogers says :

"The sea is in the broad, the narrow streets,"

must have been an engineering feat of no mean order. The

marvellous embanking of our river Thames between London Bridge and Gravesend to prevent the encroachments of the tides is of very great antiquity, and was a meritorious piece of fluviatile engineering. Who raised this giant river-wall has never been definitively decided. Some accredit it to our Roman conquerors. Others assert (and probably with better reason) that the engineers who designed it, if not the actual constructors who raised it, were the monks of the various monasteries and abbeys which were once thickly planted along the river.

These river walls are such an extremely interesting example of early hydraulic engineering that we offer no apology for making a somewhat long quotation from the words of the Rev. J. G. Wood anent them, before proceeding to our special subject :

" In the times of the savage Britons the Thames hardly deserved the name of a river. It was a mere tidal swamp, bounded on either side by ranges of hills, to which the waves reached at high water, and shrinking at low water into a tortuous muddy ditch, with no particular banks, and having on either side a stretch of pestilential mud.

" This vast area of land was not only useless, but positively harmful. No one could build a dwelling on it, and those who were obliged to live near it must have been miserable, ague-stricken shadows of humanity, if we may judge of the past by the present.

" At some unknown epoch there arose some mighty genius, who conceived the wonderful idea of shutting the water between massive banks, converting the Thames into an artificial river, and giving to agriculture the land which had for so many ages disseminated disease instead of producing grain. The man who conceived such a conquest must have been the Napoleon of the Scriptural War, in which man is bound by his very manhood not only to replenish the earth, but to subdue it.

" He could not expect to see his work completed in his lifetime, for many generations must have passed before the last sods could have been laid.

" These banks do not look like Roman work, neither were Roman remains discovered when the terrible breach in the bank was made in 1864 by the great explosion of gunpowder.

"But it does look like the work of the monks, who were just the people most capable of realizing its value to their countrymen of future generations. Had it been of Roman origin, so grand a work could not have been omitted from their histories. Nor is it likely that no monument should have been raised to the inventor, or, at least, to the emperor in whose reign the work was either begun or completed. But history and archæology are alike silent, and we have scarcely any ground even for conjecture.

"It was no ordinary mind that could view a vast swamp and conceive the idea of converting the pestilential morass into arable land, and at the same time rendering the then dangerous river safe for water traffic.

"No matter who invented or built the wall. There it stands, and so rich is the soil which it has rescued from the water, that even at the present day scarcely any artificial manure is needed, and in most places none at all.

"It has been said that he who makes two blades of grass grow where only one grew before is a greater man than he who wins a battle. What shall we say, then, of those men who turned a waste into fertile ground, and supplied grain for man and grass for beasts in almost inexhaustible abundance?"

In what may be fairly denominated the "civil" branch of hydraulic engineering, we may reckon the construction of dykes, sea-walls, and other methods of embarking land from the sea, or from tidal rivers, or those subject to flooding; the raising of breakwaters and other protections for harbors, of which the celebrated Portland Breakwater is an eminent instance in our own country; the cutting of canals, and the adjustment of proper lock-gates thereto, this being a branch of hydraulic engineering in which our own country was remarkably eminent during the last century. During that period a series of these important waterways was constructed by eminent engineers—among whom the celebrated Brindley holds a foremost place—which were of inestimable benefit to the nation, and may fairly be considered the legitimate antecessors of our present railways. Among these we may enumerate the Cromford Canal (constructed by Jessop), the Ellesmere and Chester, the Gloucester and Berkeley, the Grand Junction Canal, with its numerous ramifications, the Shropshire Canal, and the Thames and Medway Canal. Abroad we

find, among recent examples, the gigantic Suez Canal of Lesseps, and that which is now piercing the Isthmus of Darien. The construction of docks of various descriptions also come fairly into the "civil" department of hydraulic engineering.

The works with which the "mechanical" branch of hydraulic engineering are mainly concerned are either for the utilization of water as a source of power, or the raising or conveying it for the purpose of irrigation.

The employment of water-wheels with float-boards, whether of the "breast," "under-shot," or "over-shot" variety, is of very considerable antiquity, and this method of turning the power of water to account has been little improved on during the centuries. The power of water is very cleverly utilized in the well-known hydraulic-press, the invention of Joseph Bramah. A very ingenious amplification of this principle is that employed by Sir William Armstrong in his hydraulic cranes.

For raising water, the pump in some form appears to have been known from the earliest time, and the hydraulic ram may also claim a respectable antiquity. Engines for raising water for irrigating purposes are of course most important in hot countries, and the primitive "shadoof" and certain rude forms of water-raising wheels have been known in the East from an early period. A hollow worm or Archimedian screw sometimes forms a very useful engine for this purpose, and some English engineers have lately turned their attention to the fabrication of the "noria," or bucketed wheel, which is so much in use in India, and have modified and improved upon the original rude models. There is much more to be done in this direction.—*Engineering Times.*

PURIFICATION OF WATER: ITS BIOLOGICAL AND CHEMICAL BASIS.

In a paper thus entitled, which was read before the Institution of Civil Engineers some time ago by Dr. Percy F. Frankland, he describes his method for detecting the relative freedom from micro-organisms of different waters, or of the same water

at different times, by Koch's process of cultivation upon films of nutritive gelatine. Perhaps the only weak point in Dr. Frankland's deductions, from the observed results obtained by his process, is that he asserts that the number of "colonies" of organisms produced upon the film are a direct indication of the actual number of organisms present in the original water, each "colony" being supposed by him to originate from a single organism. Now, it is clear that several organisms might be collected upon one spot of the film at the moment when the water was poured upon it; and from these but one colony would result. However, there seems little doubt that the number of colonies must be an indication of the relative abundance of organisms in the water from which they are derived. Several very important practical results are arrived at and emphasized in the paper. For instance, it has been found that even coarse-grained filtering materials, such as sand, are efficient in removing micro-organisms from water, although the channels which exist therein are too large to arrest mechanically the passage of these minute bodies. The same filtering agent, however, cannot be used for an indefinite time, for the organisms diffuse out of it after a while, and become once more distributed through the water. Dr. Frankland takes five of the London water companies, and classifies them according to the excellence of their provision for water purification in four particulars, namely:

1. Storage capacity of unfiltered water.
2. Thickness of fine sand for filtration.
3. Rate of filtration; and,
4. Frequency of renewal of the filter beds.

And he finds that the number of micro-organisms found in the water supplied by these companies is smaller in proportion to the perfection of their arrangements in these four points combined. It is to be hoped that the nature as well as the number of the organisms present in drinking-water may be studied more universally than hitherto, by the aid of Dr. Frankland's process, which seems to be simple and practicable.—*British Medical Journal.*

TESTS OF TRAP EFFICIENCY.

REPLY TO MR. BROWN'S "DISSECTION."

THAT a writer should be allowed to publish, uncorrected, very serious errors in matters of fact upon which some of the most important questions in sanitary plumbing are hinged, in reports to Government officials at the Museum of Hygiene, based on apparatus erected in part at the Government's expense, and that these errors should be reprinted uncorrected in the leading sanitary and engineering periodicals of the country, shows a very lamentable state of affairs, and promises that, for some time longer at least, our plumbing laws are quite as likely to be founded upon illusions as upon facts.

In matters so directly affecting the health and welfare of the entire public, why should so much uncertainty and ignorance be allowed to exist? Why should the investigations and practical experiments be left to private individuals? A small proportion of the money spent by the public in complying with burdensome and unnecessary exactions in the plumbing laws would pay for a series of scientific experiments which would definitely settle these disputed points, and remove unsound theories and the objectionable features in the laws which are based upon them. If it is thought unnecessary to erect new apparatus for making these experiments, why should not the apparatus already erected by private enterprise be employed for experiment by some commission at once competent and disinterested, appointed either by Government or, as has been wisely suggested by the *American Architect and Building News*, by scientific bodies interested in the subject and in the public welfare?

The apparatus used by myself for such experiments could undoubtedly be availed of, and would, I am certain, be found to be suitable to yield a positive and satisfactory answer to all the important questions at issue. I refer to the apparatus used in the experiments for the Boston City Board of Health, which was erected, not for these tests alone, but for actual

plumbing service in the building, and which was representative of the average plumbing work built in the better class of houses to-day.

The apparatus erected at the Museum of Hygiene, on the contrary, was not representative of practice, and was built outside of the building in the open air, exposed to the elements. Hence tests on this apparatus, especially to investigate the question of evaporation, would evidently be totally unreliable Moreover, the size and arrangement of piping was altogether unusual, and the apparatus employed for producing siphonage was such as would never be found in plumbing practice.

Most prominent among the errors committed by Mr. Brown, in common with others who jump at conclusions in this field without great caution and thorough study, are the assertions regarding back pressure and evaporation. In general, he attaches great importance to the first, notwithstanding the fact that our modern improvements in sewer and soil pipe ventilation have really deprived it of its power for mischief, while he quite ignores the latter, which our modern trap-vent laws have rendered a really formidable source of danger.

We will take for illustration the sixth clause in Mr. Brown's "Dissection," which reads thus: "I have found that no special bend can be located as the point of such friction. The sides of a straight pipe seem to cause all the friction that is required for such back pressure."

This statement is altogether at variance with facts. It would have been easy for its author to have learned the contrary, either from simple calculation, from direct experiment, or from what has already been published on this subject.

The sides of a straight pipe do *not* cause the friction required for back pressure. To satisfy himself of this, without calculation or reasoning, it would only have been necessary for Mr. Brown to remove the bend and trap, the true and only causes of his back pressure, and repeat his tests on the straight pipe without them. He would then have found the water in his traps in no way affected by back pressure, even under his severest tests. Any one familiar with the principles of hydraulics and pneumatics would have known this, and practical experiments here might seem superfluous. Nevertheless

the experiment has been made on the apparatus referred to as used by me and shown in the annexed cut (Fig. 1) in the report referred to.

The first experiments on back pressure were made with a double bend at the foot of the perpendicular run of soil-pipe connecting it with the horizontal iron drain in the cellar. Unusually severe strains were brought to bear upon the trap seals in some of the experiments, in order to produce the strongest possible back pressure. For this purpose a tank and a four-inch plug outlet therein similar to the arrangement employed at the Museum of Hygiene was used in the third story. The strains were severe enough to siphon clean out an S-trap fully vented at the crown with a one and a quarter inch vent pipe ten feet long. It was found that a powerful back pressure was produced by the falling water piston at the lowest branch outlet in the basement just above the bend. On the first floor the back pressure was light, and would produce no appreciable effect whatever on trap seals, and on the second floor it was still more feeble. In all cases this pressure could easily be resisted, and the entrance of air-bubbles from the soil-pipe entirely prevented by a column of water in the trap from twelve to sixteen inches high, measuring from the top of the fixture outlet to the bottom of the trap seal; the back pressure decreased rapidly as the branch receded from the bend at the bottom of the soil pipe. This bend was now removed, leaving the lower end of the soil-pipe open, and the experiments were repeated, all the conditions otherwise being the same.

At no part of the pipe could the slightest trace of back pressure on trap seals connected with any of the branches be perceived, or the slightest movement or vibration due to back pressure be developed. But every S-trap seal, though full vented, was instantly destroyed by siphonage after the current had passed the mouth of the branch, showing the severity of the trials.

Experiments for back pressure were made under a great variety of conditions, producing strains of every degree of force. These have already been described in our report to the Boston City Board of Health, and need not be repeated in detail here.

All our experiments showed, first, that back pressure is

caused by some sudden bend or obstruction in the pipe, and never by mere friction along its sides; second, that back pressure strong enough to require any special provision to guard against it in plumbing practice could only be developed close to such bend or obstruction; third, that the "Sanitas" trap, or any trap holding a body of water sufficient to fill a pipe between the outlet of the fixture and the bottom of the trap seal, and placed far enough below the fixture to give this pipe, from the top of outlet to the bottom of the trap seal, a length of from twelve to sixteen inches, would be capable of resisting the severest back pressure that could ever be encountered in good plumbing. To give this length of pipe would only require a trap to be set three or four inches, at the outside, lower than is now generally customary. Indeed, it would be impossible to set most traps much higher than this, on account of their form and of the arrangement of the fixture outlet coupling. Pot or round traps are usually set as low as the floor boards. Finally, fourth, that no bubbles from the soil-pipe could ever be driven through the seal so formed and placed by back pressure, for it is evident that no air can be forced through so long as the dip of the trap remains covered with water, as shown in Fig. 2 of the report. A trap formed and set as shown in Fig. 3 of the same report, on the contrary, would permit air-bubbles to be pressed through it. All this is self-evident to any one familiar with hydraulics or the movement of fluids in traps.

Mr. Brown makes the assertion that "the Sanitas trap likewise siphons when the top of the soil-pipe is closed." A plumber's trap is *siphoned* when its seal is destroyed by siphonage in *plumbing work*, not when it is pumped out by a force-pump nor exhausted by apparatus never encountered in plumbing.

The "Sanitas" trap has never been siphoned in plumbing work, and the implication that it has has no foundation in fact.

The other paragraphs in Mr. Brown's "Dissection" have been sufficiently met in my reply to his original report, and need no further consideration.

Respectfully yours,

J. PICKERING PUTNAM.

CHIMNEYS AND VENTILATION.

It would seem that in America more attention has been paid to the art of building comfortable houses, and that here this art has been carried to a greater perfection than in any other country of the globe, and average Americans, whether living in town or country, can say that they are better housed than the people of any other nation.

Yet, while we have in a great part of our country a climate which for some months of every year is almost arctic in character, and which involves dependence upon fires during nearly half the year, the chimney is a much-neglected portion of our domestic architecture. This is the more unaccountable since upon the performance of the chimney depends, in a great measure, the comfort, and in many cases the health of the house. Stoves, ranges, and furnaces smoke and emit gases, and the intelligent householder condemns them. To remedy the troubles he seeks out a manufacturer who makes steam-tight furnaces and ranges, in which every joint is as tight as a boiler seam. He thinks he has in this feature of construction the remedy for his troubles. He seldom thinks of having a good chimney put in the place of his old one, which, were the fact known, is responsible for the whole of the fault.

This carelessness in regard to the chimney is surprising, because it comes from indifference or inertia, and not from lack of knowledge. People seem to regard a bad chimney as a sort of dispensation of Providence, to be endured like a cold winter or a heavy storm, and not like an evil thing which can be made right. As the readers of the *Metal Worker* know, from the experience of correspondents whose letters have been published, good chimneys are a possibility, and no house-owner should rest until his building is properly provided with them.

The faults of the average modern chimney are many and great. The commonest fault is that the flues are too small. This, with the roughness, which is the besetting sin of the flues, makes it almost impossible to produce a draught. Sharp

bends, which are also introduced quite frequently, still further diminish the draught. Thin walls to a chimney greatly aid in cooling the air inside, and when we find that the chimney is placed in an outside wall of the house, there is little wonder that the draught is poor. Common sense would dictate placing the chimney in the centre of the house, or in a position where the hot flues would not be cooled off in the vain attempt to heat "all out doors." Again, placing the chimney in the outside wall in many cases brings it through the roof at a low point. Unless the chimney shaft is unnecessarily tall, the top is below the roof, and a smoky chimney results from the wind blowing down over the roof peak.

Rough flues favor deposits of soot, rendering frequent cleaning necessary where bituminous coal is used, and forming lodging places for the creosote-laden soot from wood fuel. In the one instance the draught is stopped in a short time, and in the other the creosote soon attacks the mortar. In wood-burning portions of the country a very large percentage of the kitchen flues will be found to have the mortar badly corroded from this cause. When wood is in any way exposed against such flues fire is very likely to follow in time, and the leaky chimney puts an end at once to itself and the house.

Corrosive as is the creosote from a slow wood fire, the soot and gases from the bituminous coals of the West seem to be even more destructive to mortar. The worst attacks appear to be made upon the outside of the chimney tops. This, it would seem, in the absence of any direct chemical proof, was the result of the action of rain-water upon the sooty deposit.

The huge brick chimney which our ancestors were wont to raise in the centres of their dwellings was the outgrowth of long experience. Comfort meant an ample fire with a good draught, and no suggestion of smoke and no danger from fire. They built therefore a stack of chimneys with ample flues.

Each of the fireplaces on the lower floor had a flue to itself, and very often those on the upper floor were equally well provided. Being in the centre of the house, the chimney pierced the roof at its highest point, and in those old-fashioned square houses with pyramid roofs there was not even a ridge along which the wind might be driven in eddies. The draught was

unexceptionable, and a smoky fireplace was a thing not to be found. The strength of draught obtainable from such a chimney was surprising. It sometimes happened that, for the sake of convenience, an opening was made through the hearth into the ash-closet in the cellar. This opening, which was covered with a sliding plate, was used for dropping the ashes into the ash-closet and as a blower for the fire. It usually took up the space of a brick. When opened to the extent of half an inch the fire would roar like a blacksmith's forge when the bellows is going. Such a draught is not to be found once in fifty times in any modern-built chimney.

To produce a good and satisfactory chimney something of the old principle must be observed in its construction. Both for the protection of the flues and the utilization of the heat, the stacks should be in a central position in the house. This has a double advantage ; it enables the flues of several rooms to be combined, and it brings the chimney near the highest portion of the roof. It can, therefore, be made to rise above all projections without the necessity of making a long neck and unsightly draught. Instead of being a neglected portion of the house, the chimney should be planned with as much care as the parlor, the kitchen, the library, or any of the more important features of the house.

When it is considered that the chimneys of a house must take away the products of combustion for all the fires in it, and must also contain the flues for ventilating the rooms, it will be seen that some thought ought to be given to their construction. It may be taken as a rule, to which there should be no exception, that every sleeping-room should have an opening into a chimney flue. This should be not more than two feet from the floor. By means of this opening, if the chimney stack is constantly warmed, good ventilation can at all times be secured. In fact, in any sleeping-room that we have ever seen such an opening can be made to give as perfect ventilation as is needed. It must be understood that such an opening is needed even if the room is not to have a fire.

The ventilating flues must be kept separate from those that are used for taking away the smoke, yet the latter must be used for heating them. The smoke flues must be made smooth inside, either by building a pipe into them or by care-

fully finishing them with plaster. The common fault of making them crooked should be avoided. The size should be ample. A flue of 4 x 8 inches should never be tolerated. We do not now remember one that is wholly satisfactory, and do not think they can be made so.

If a room is intended to have a fire in it the smoke flue will answer for ventilation. The devices for bringing outdoor air into a room and heating it in order to obtain a fresh supply and assist in the ventilation are entirely useless. If we provide in the chimney proper means for taking the foul air out of the room, there is no danger of a want of fresh air. It will come in through windows, doors, and the very walls themselves, and a pure atmosphere will be the result of the perfect chimney.—*From the Metal Worker.*

Death at Wholesale and Retail.—Gas-stoves in the form of open cylinders are now popular. They offer many advantages to persons of elegant leisure. They are very clean, they call for no greater labor than the lighting of a match. They can be made to produce any degree of heat.

And yet there are some drawbacks to these labor-saving inventions. Take a room ten by ten by twenty feet. This contains two thousand cubic feet of air. Air is composed of about twenty per cent of oxygen and eighty nitrogen. In the combustion of the gas-stove all the oxygen of the air is used up, leaving nothing but hydrogen, which will not support life. If the gas-stove emits four square feet of this devitalized air into the room every second, in one hour nineteen thousand feet of nitrogen is poured into the room. This is nine times the whole volume of air which the room contains.

The effect on the lungs can be readily imagined. Blood diseases, asphyxia, rheumatism, and death in every variety of form naturally result, whenever any one enjoys for a brief period the pleasures of the gas-stove.

Unless a person holds a large life insurance policy, or has lungs of brass, he should close his ear against the soft persuasion of the gas-stove circular.—*The New Constitution.*

EFFECTS OF ZYMOTIC DISEASES UPON THE TEETH.*

By Dr. F. S. Whitslar, Youngstown, Ohio.

In the consideration of this subject we are brought to the investigation of not only the causes of decay of the teeth, but of the arrest of the developmental process. Causes of decay are twofold, and may be classed as predisposing and exciting. You will bear in mind that these two divisions are clear and distinct. There are many things which predispose teeth to decay, but we know more of the exciting than of the predisposing causes. When the structure is imperfect they are more likely to decay than when they are perfect. Then again the teeth may be comparatively well organized, but owing to defective nutrition and enfeeblement of the vital forces, they are more susceptible to decay. With regard to exciting causes there has been much discussion. Grouping the various opinions entertained by those who have experimented and written extensively upon the subject, we have those who regard it as a *real* disease, a vital phenomenon, strictly comparable to morbid conditions of other more highly organized parts of the body; then those who regard it, in the main, as the effect of mere chemical action, but also consider that some very constant appearances are only explicable on the hypothesis of vital action. Then again it is regarded as wholly and entirely the effect of chemical action, in no degree modified by connection with a living organism.

Fox, Bell, Hunter, Cuvier, Hertz, and Newman maintained that dental caries is an inflammatory affection, a *true* disease of the dentine; and the name of *odontitis* was given to this supposed disease. This theory has so much evidence against it, and so little in its favor, that it need not detain us any longer.

Furthermore, as preliminary, I wish to call attention to the constituents—the elements of the teeth—and the bonds which

* Read before the Northern Ohio Dental Society.

hold them together. Of the sixteen elements composing the human body, about twelve are found in the structure of the teeth, and may be classed into organic and inorganic matter. The bonds which hold together or maintain the structural integrity of the teeth are, first, the vital; second, the chemical; and third, the mechanical, the latter depending upon the first two. Remove the vital principle from a tooth, and the chemical force soon begins to be impaired, and disintegration from the first is comparatively an easy process. The vital force when present holds the peculiar chemical affinities that exist here in its grasp, and the latter are at their best only when thus governed.

Having indulged in these general statements, we approach the subject. What are zymotic diseases? Dunglison informs us that a zymotic disease is any epidemic, endemic, contagious, or sporadic affection, which is produced by some morbific principle acting on the organism similar to a ferment, as the major *exanthemata*. In the classification of Dr. William Farr, zymotic diseases comprise those which are epidemic, communicable, inoculable, capable of propagating from existing *foci*, or by the want or bad quality of food. This class includes four orders: miasmatic, enthesic, dietic, and parasitic.

The first thing to which we ask your attention, as a probable effect of zymotic diseases upon the teeth, is the partial arrest of their development. The crowns of teeth, bearing the marks of interrupted development, instead of presenting the smooth and glossy surface characteristic of finely developed enamel, are disfigured by the presence of irregularly grooved and pitted surfaces, usually accompanied by a considerable diminution of size. The incisors are commonly very thin and compressed, while the cuspids and the cusps of the molars are terminated by sharp points. The enamel and dentine tissues are not only deficient in quantity, but are defective in quality. The enamel will be porous, yellow, opaque, and fragile, while in the dentine that uniformity of size and arrangement of the dentinal tubes, which they exhibit in well-developed teeth, are wanting. The defect of structure will be found limited to such portions of the several teeth as were undergoing development at the same time, and were consequently under the

same constitutional state. We sometimes find teeth which are marked by grooves and ridges regularly disposed. The grooves are the result of imperfect and the ridges of perfect development of the enamel and subjacent dentine. These transverse markings resulting from alterations in the developmental process find almost an exact parallel in the striæ produced by similar causes on the nails. This parallel points to the theory that the teeth are appendages of the skin, and belong to the dermal or tegumentary tissues. You are doubtless familiar with the statement of Tomes that "the mucous membrane which lines the alimentary canal is continuous with—is, indeed, a part of the external skin, with which it blends at the lips, and that all teeth are alike developed from a part of the mucous membrane, and any connection which they may ultimately get with the bone is a secondary matter."

Salter says: "Teeth certainly are not extraneous organs, as suggested by Hunter, but have a distinct vitality. They undergo nutritional changes by virtue of a plasmic circulation in their tubular structure; and two of their hard tissues manifest sensibility, which in disease may be exalted to extreme painfulness. The teeth are not parts of the true skeleton, but may be considered as elements of the dermal skeleton. They are developed from the tegument of the mouth, and though closely embraced by the alveolar processes of the maxillary bones, are never in man united to them."

Now, while we cannot in every case trace this ridged, pitted, honeycombed condition of the teeth to the presence of serious illness of the patient during the time when the defective portions of the teeth were being developed, it can scarcely be doubted that an imperfect organization of the teeth, if not the result of some special disease, such as measles, influencing the system generally, is yet consequent upon constitutional conditions.

The simple fact that if one tooth is affected, those parts of other teeth which correspond in respect to the period of formation will present a similar condition, precludes the supposition that the effect is merely due to a local cause. Hereditary syphilis in its effects may often be traced as the cause of a peculiar dwarfed condition of certain teeth. The incisors and cuspids are of small size, and peg-shaped; the crowns are

notched, the notch being, in the main, a concavity from the one corner to the other, though there may be secondary notches in this general concavity. This class of teeth, which we note as syphilitic, have a dusky, opaque appearance, and are relatively small. They are of a very soft character, and consequently wear down very rapidly. Moreover, it is claimed by the best authorities that constitutional syphilis is capable of modifying the nutrition of many parts of the body, manifesting its influence in attacks on the hair, the nails, and the skin generally. Now, the homological relation which exists between the teeth and various dermal appendages may serve, if not to explain, at least to render less surprising, the fact that the developing teeth should be a chosen site for its manifestation.

So much for the arrest of development. Now, what are the effects of zymotic diseases upon teeth which have none of the marks of partial development? We answer that all febrile conditions or diseases predispose teeth to decay. First, by diminishing vitality. Second, by changing the secretions of the mouth so that they act injuriously upon the teeth. In dyspepsia we have not only the predisposing, but also the exciting causes of decay, as it not only impairs vitality, but prepares, in the stomach, an acid that is continually being thrown upon the teeth, which acts upon them with great energy. I need hardly say that residence for any length of time in miasmatic regions, inducing unfavorable conditions, institutes a predisposing cause. And, in brief, all epidemic, endemic, dietic, and enthetic diseases derange the functions of the body, vitiate the secretions, impair the vitality, and may be classed as predisposing causes of decay.—*Ohio State Journal of Dental Science.*

FAITH-HEALING.—A family living in the city of St. Louis had a daughter who was very ill. The members of this family were well acquainted with one of the leading advocates of faith-healing in the East, who made her case a subject of prayer, and wrote her a letter declaring that she would certainly be cured, as the Lord had revealed it to him. The letter arrived in St. Louis one day after her death.—Rev. Dr. Buckley, in the *Century.*

RECENT ADVANCES IN PREVENTIVE MEDICINE.*

By GEORGE H. ROHÉ, M.D., of Baltimore, Md., Professor of Hygiene in the College of Physicians and Surgeons; Chairman of the Section on State Medicine, American Medical Association, 1887.

PROGRESS in any branch of science or art may be measured either by the number and character of new discoveries made, or by the gradual advances in the application of knowledge previously acquired. Judged by either of these criteria the record for State medicine during the past year is a creditable one.

In the field of epidemiology and endemiology, the progressive extension of the fifth great pandemic of cholera first claims attention. Extinguished in the portions of Italy, France, and Spain ravaged in 1885 and 1886, it has slowly invaded south-eastern Italy, Hungary, and other Austrian possessions, and has been imported into South America, whence it threatens the United States by several routes. The danger of invasion of this country is at present greater than at any time within the past three years.

Yellow-fever inoculation, as practised by Freire in Brazil and Carmona in Mexico, has claimed a large share of the attention of sanitarians during the year. The claims made in favor of this method of preventing this scourge are now being subjected to an official investigation authorized by the United States Government.

Diligent search has been made for the specific organism supposed to be the infective agent in vaccine virus, but without definite success. The results obtained are not entirely negative, however, and one may cherish the hope that a solution of this problem will soon be reached.

The relation of a peculiar disease of cows to scarlet-fever, and the discovery of a specific microbe in the blood in the latter disease, have attracted much attention. The restriction

* Abstract of the Address in State Medicine, delivered before the American Medical Association, at the Thirty-third Annual Meeting held at Chicago, Ill., June 9th, 1887.

of scarlet-fever will doubtless be more thoroughly effected so soon as physicians are convinced of its bacterial nature, and clearly comprehend its mode of transmission. Statistics are given showing what has already been accomplished in this field.

Sternberg, Fränkel and Weichselbaum have studied the specific microbe of croupous pneumonia, which the former regards as identical with his *micrococcus Pasteuri;* in which opinion both the other authors mentioned coincide. Dr. Baker, of Michigan, has also shown that croupous pneumonia seems to be dependent upon a cold, dry atmosphere.

Measures for the restriction of pulmonary tuberculosis are adverted to. Tuberculous patients should not be treated in the same hospital wards with non-tuberculous individuals, and prompt disinfection of the sputa and other discharges should be practised in order to diminish opportunities for infection. General sanitary measures should, however, not be neglected in the warfare upon the bacillus. There is danger that a too exclusive attention to the microbian factors of disease will narrow our views of epidemiology and preventive medicine.

It seems to be established that the micro-organism discovered in the intestinal lesions and discharges in typhoid-fever is the cause of this disease. The fact that this microbe may preserve its vitality for a considerable time in water and ice has been shown by Bolton, Wolffhügel, Prudden, and others. This, together with the well-known history of outbreaks of this disease undoubtedly depending upon pollution of drinking-water, should make prompt measures of disinfection imperative in every case. The physician fails in his duty who neglects measures for the thorough destruction of the typhoid infection existing in the intestinal discharges.

The importance of disinfection of bedding, clothing, and other personal and household articles in contagious diseases demands that health authorities should have under their control establishments where disinfection can be carried out on a large scale and at public expense. Such institutions are now in use in Berlin, Düsseldorf, Göttingen, Strasburg, Breslau, Leipzig, Danzig, and other cities in Europe. The results are pronounced to be exceedingly beneficial. Steam under pressure is regarded as the best disinfecting agent.

Quarantine, a word which for more than five centuries has been synonymous with barbarism, is becoming under modern methods a safeguard to the public against infection and an advantage instead of obstruction to commerce. The results achieved at the model quarantine station at New Orleans encourage the hope and almost warrant the prediction that the days of the quarantines of detention, whether by sea or land, are past, and that quarantine in future will mean simply *thorough disinfection* of fomites, and, of course, effective isolation of persons already infected.

Cremation of garbage seems to be the best method yet devised for the inoffensive destruction or final disposal of solid city wastes.

The irrigation system of sewage disposal has steadily won favor. In Berlin, Breslau, and Danzig, in Germany, Birmingham in England, and Pullman and other places in this country it has been in successful operation. Chemical precipitation and purification of sewage has also been adopted with satisfactory results in various German cities. A board of distinguished engineers recently recommended the same system for the city of Providence, R. I.

Professor Vaughan's discovery of a very poisonous ptomaine in cheese, ice cream, and milk undergoing certain chemical changes has been confirmed by a number of investigators in various parts of the country. Vaughan's suggestion that tyrotoxicon may be found to be the poison which produces cholera infantum opens up a new field for investigation in which every physician must of necessity be interested.

Analysis of food and drugs made during the year in Massachusetts and New York show the wide extent to which adulteration is practised and how the people are defrauded. Among the most startling instances are olive oil, of which 68 samples out of 91 were spurious. Vinegar was adulterated in 79 samples out of 116; mustard, 124 times in 211; white pepper, 63 times in 128; black pepper, 41 times in 71; mace, 29 times in 45. Of nine samples of horseradish examined only one was found genuine. A precipitate of uncrystallizable sugar and coloring matter and chloride of tin (poisonous) is sold to candy-makers for making confectionery. Citrate of iron from respectable manufacturers contained three and one half per cent

of quinine instead of the twelve per cent demanded by the pharmacopœia. Authority and means should be given to the health authorities to protect the public from these frauds, many of which are a source of danger to life and health.

Statistics collected by the speaker show that five sixths of the inhabitants of cities in this country have no facilities for bathing except such as are afforded by a pail and sponge, or an easily accessible river, lake, or other body of water. The establishment of public baths is urgently recommended both as a sanitary as well as moral measure. Tub or pool baths are objectionable both on account of expense and lack of privacy in the latter. The spray baths in use in the German and French army barracks are recommended. These are not expensive, either in first cost or administration, and allow each bather absolute privacy and the opportunity for a thorough cleansing in clean water. Public baths should be open the year round, and not only during the summer.

A number of instances are grouped together showing how the enforcement of appropriate sanitary measures has saved life. In Michigan the saving of life from one disease (scarlet-fever) has amounted during the last eleven years to 3718, or 338 per year. In 1886 appropriate sanitary measures saved the lives of 298 persons who would have died of diphtheria if such measures had not been enforced. In England and Wales the average annual saving of life due to sanitary measures has amounted, in the five years ending 1885, to 62,000. In Baltimore a marked reduction of deaths from infectious diseases has followed the enforcement of certain sanitary precautions. In Memphis the death-rate has been reduced in six years from 35 per 1000 to 23.80 per 1000. In Chicago the reduction in mortality in the last five years has been from 25.69 per 1000 to 19.46 per 1000, a net saving of 17,214 lives in that city during that period.

While all advances in sanitary administration have doubtless contributed to produce these good results, the main influence is to be attributed to three factors. These are *compulsory notification of infectious diseases; prompt and effective isolation of the sick and infected, and thorough disinfection of all infected articles and sources of infection.* These must be the watch-words of the practical sanitarian of the future.

TEA COMMERCIALLY CONSIDERED.

WE took occasion, some months ago, in commenting on the relief afforded to Java tea in the Netherlands budget, to remark that Chinese statesmen also would do well to realize the fact that Indian tea is a sufficiently dangerous competitor on its merits, without being helped by a handicap on its rivals. There is no doubt that one reason of the rapid increase of production of India is the absolute freedom from impost, and Holland is wise in giving the nascent industry in Java similar encouragement. China tea is handicapped in two ways. Sir Robert Hart has lately pointed out that the imperfect preparation of the leaf places it at a disadvantage with the produce of its rivals, which it will feel more keenly as the shipments from India and Ceylon augment still further in quantity ; and —supplementing this argument—there has lately appeared, in the columns of our Shanghai contemporary, a series of letters insisting that heavy taxation is a still more serious factor in the case. It is beyond question that China tea might be very much improved if the same care were given to its manufacture as is given in India, Ceylon, and Java ; still, though the export figures have lately become stationary, the taste for it is not dying out ; England and America will still buy it at the same relative value as that from other countries ; " but buyers naturally look for the best value, and that can undoubtedly be better found in the duty-free produce of other countries." The import duty of sixpence a pound which it encounters in England is no doubt in itself a heavy burden, and we have more than once suggested that there is room for grave remonstrance against the incidence of a tax which amounts to nearly a hundred per cent on the cheaper teas, and only five-and-twenty on the dearer. It might perhaps be argued that, from this point of view—the China teas being the cheapest in the market—it constitutes an indirect handicap on the latter against their dearer rivals. There is, however, here no direct disadvantage. The sixpenny duty falls on all teas alike—whether from India, Ceylon, Java, China, or Japan. Where

the shoe really pinches is at home. In India and Ceylon there is no tax at all ; in Japan the duties amount only to about one dollar a picul ; while China tea starts with a handicap of from thirty to forty per cent in the race. In the Hunan and Hupeh provinces, it appears that local duties are exacted ranging from Tls. 5.22 to Tls. 5.38 per picul—nearly, in fact, doubling the export duty ; while the districts which feed Kiukiang have to pay from Tls. 4.41 to Tls. 5.74, and green teas of Chekeang from Tls. 4.05 to Tls. 5.17. The legitimate export duty of Haekwan Tls. 2.50 per picul constitutes, of course, the larger portion of these amounts, and that is probably the only portion which subserves imperial purposes ; lekin—ranging from about a tael and a half in the majority of cases, to H. K. Tls. 2.50 on one district of Kiangsi—comes next, and various petty local taxes go to make up the total.

It may well be asked, How can China tea be expected to hold its own, under such conditions, against absolutely untaxed rivals? The policy of remitting direct taxation, in faith that compensation will be found in a consequent increase of general prosperity, is, as we remarked on a former occasion, as opposite as possible to the principles of Chinese Government ; and even if Peking statesmen could be brought to see that China tea, weighted by lekin and local taxation, and subject to a heavy export duty besides, is unwisely handicapped, the bare idea of relieving it of all the various squeezes which go to fill the pockets and coffers of the local officials would be sufficient to produce a rebellion in Mandarindom. Either by direct remission, however, or by a more gradual process of evaporation, it seems clear that a great portion of these taxes are certain to pass from them. If the trade is not relieved from their pressure, it will be gradually killed by increasing competition. "England," to quote the concluding words of the writer whose statistics we have taken, "will be virtually independent of China in a few years, owing to the rapidly increasing production of India and Ceylon. The United States, another large customer, promises to be chiefly supplied from Japan. Can China afford to lose the two best customers she has? She can only retain them by a great effort. First, by making tea duty free ; second, by improving the article itself."

We remarked, in a recent article on the same subject, that

the Chinese are indebted to Sir Robert Hart for having impressed it upon their attention. They will be still more indebted to him if he will return to the attack with improved statistics and with the additional weapon which the above arguments furnish. We pointed out that the figures quoted by him for India and Ceylon produce were—unless a clerical error could be suspected—very far below the mark ; and his representations could obviously not be expected to have the weight they deserve so long as they fail to indicate the real extent of the competition. A quarter of a century ago China had nearly a monopoly of supply to the tea markets of the world. The demand for tea has since then very greatly increased, but though the value of her tea has fallen heavily, her export stands nearly where it did ; while an additional supply of 115,000,000 lbs. has grown up from India, Ceylon, Java, and Japan. The 260,000,000 lbs. sent forth by China still give her an immense preponderance ; but the fact has to be faced that they constitute now only two thirds instead of, as they once did, nine tenths of the world's supply. Hitherto, as we have said, increasing demand has kept pace with the increasing supply from other quarters, but that supply threatens to increase so rapidly within a very easily measurable period, that keen competitition must ensue, in which the heavily taxed and less carefully prepared China tea is sure to suffer. Already the increase of export which might have been looked for under fair conditions has been stopped ; in one case even the current would seem to have turned—the export of green, which in 1874–75 reached 31,000,000 lbs., against 19,500,000 lbs. from Japan, having fallen this season (1886) to about 28,000,000 lbs., against 38,000,000 lbs. from Japan ! Let the Inspector-General of Customs, we repeat, return to the attack with greater vigor, improved statistics, and greater breadth of argument than before. There is here, as his commentator points out, no question of conceding anything for the benefit of foreigners. It is one of importance to the Chinese themselves. If the duties are not reduced, they must be prepared to stand by and see the tea trade go to other countries which have a more intelligent fiscal policy. " China will then grow merely for its own wants, and the districts which have profited by supplying foreign markets will become impoverished ; while a

speedy reduction would again give life and importance to the trade." The prospect may seem remote ; 260,000,000 lbs. is a great figure to overtake ; but the tendency is distinctly in that direction, unless Chinese statesmen and Chinese growers agree to mend their ways.—*Tropical Agriculturist.*

EDITOR'S TABLE.

YELLOW-FEVER IN KEY WEST appears to be left to the process of self-exhaustion : 26 cases with 9 deaths recorded up to June 14th since the outbreak, and so far as we have been able to learn with little or no effort to stay its progress. With four propitious months yet before it and subjects in abundance, the probabilities seem to suggest that in the exercise of the President's discretion in the disposal of the Congressional appropriation for the prevention of epidemic diseases, the neglected opportunity at the *outset* has already well-nigh merged itself into a reversion of the Congressional intent, in that, instead of being promptly applied to the exercise of preventive measures immediately after the place was discovered to be infected, by the destruction of fomites, involving, if necessary, the temporary removal of the well as well as the segregation of the sick, the appropriation will be devoted to the results of the neglect : the care of the sick, the burial of the dead, and, perhaps, to a general clean-up *after* the disease has done its worst. This is the way to promote epidemic diseases—not to prevent them.

A "MALPRACTICE" SUIT for such prompt action as that which is the common characteristic of competent surgeons was decided in Mansfield, O., June 4th, 1887, in favor of the defendants—Drs. R. Harvey Reed and J. W. Craig.

Joseph Patton was injured October 22d, 1885. His left leg was amputated by Dr. Reed. The right foot had been run over by the cars. The wheel, according to the testimony, passed over the foot at right angles to its length. The foot was amputated next to the ankle by Dr. Craig, Dr. Reed assisting. The operation is what is known as Chopart's operation. The plaintiff and his family claimed to have protested against the

operation being made so high up and thought a large part of the foot, especially the great toe, might have been saved. In a few days Dr. Reed was given notice to discontinue his services and Dr. Erwin was put in charge of the case. Shortly after, a suit was brought against the physicians for $20,000 damages.

As usual, in such cases, "doctors" were forthcoming who had opinions of such cases without practical experience to sustain them; and who, doubtless, had the patient been left to die of tetanus or gangrene in default of operation, would have been just as ready to testify to surgical neglect, as they now were, on the recovery of the patient, to unnecessary surgery. One thought that he "would have tried to save the foot"—omitting to add, at the risk of losing the life. Another, who confessed that the extent of his experience in railroad surgery was "that he had helped once to amputate a foot that was crushed by the cars," but in this remarkable foot, where the wheel had passed over it at right angles to its length, "he found no special injury to the tissues—none of the osseous tissues crushed at all." Another found "that the third, fourth and fifth metatarsal bones were fractured. Thought the third was crushed. Said he would have amputated the third, fourth and fifth metatarsal bones and tried to save the rest of the foot." And on cross-examination said the cuboid bone had the appearance of being pulled off and that the internal cuneiform bone was broken. The cartilage was pulled off and that was a serious injury. He said, "If I had found that the foot was cold and the watery part of the blood was oozing out it would indicate that the circulation was cut off and there would then be no doubt about amputating." And another stated that in "his opinion the inner part of the foot might have been saved, provided a certain artery had been found intact," which was severed; and in his cross-examination admitted that "his 'theory' of the injury was deduced from the observations of certain non-medical men who witnessed it." Two or three others exhibited about the same want of knowledge. On the other hand, Drs. W. H. Race, of Mansfield, I. W. Hamilton, of Columbus, F. C. Latimore, of Mt. Vernon, Proctor Thayer, of Cleveland, J. P. Cowan, of Ashland, and Solon Marks—all men of practical experience, and some of them of special experience with railroad

injuries—were of one opinion : that prompt amputation was the proper thing to do, and that the operation performed was the right one ; that injuries of this kind were not only dangerous to life but that the parts themselves seldom got well, and if that did happen were of little service.

The case excited a good deal of public interest from the outset, and the more by the open secret that Dr. Reed charged that Dr. A. J. Erwin, who supplanted him, was a professional enemy, actuated by malice toward him, and was the instigator of the whole trouble ; and had he gone on the stand Dr. Reed proposed to prove it to the jury. Dr. Erwin, however, avoided the ordeal, and nothing in regard to his alleged chicanery was brought out in the trial.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

The Fourth Annual Meeting of this Association, held in Johns Hopkins University, Baltimore, Md., May 31st to June 1st, 1887, was one of the most successful it has ever held, in the importance of the papers presented and the subjects discussed, but, unfortunately, as in the last previous meeting, the time was so near that of the American Medical Association as to prevent the attendance of several members allied to, but unable to attend both, and who consequently attended the larger, more comprehensive and older body. The address of the President, Dr. Frank Donaldson, of Baltimore, on "Tuberculous Heredity and its Prophylactic Treatment," discussed the nature and treatment of this disease from the most authentic points of observation, from which he formulated the following conclusions :

1. The presence of the parasite, the tubercle bacillus, as a pathogenic element. This is a factor necessary for the production of the disease.

2. There is a prominent element in about thirty per cent of the cases ordinarily met with—a susceptibility transmitted by heredity.

3. The mal-hygienic and debilitating agents such as foul air, sedentary occupations, violations of the laws of health, and other diseases, have a powerful effect, by impairing the nutrition, in developing the disease.

He showed that in this country, as in England, there had

been a gradual decrease in the mortality rate of tuberculosis during recent years. That in Massachusetts, for example, there has been a gain of 54 lives per 100,000; in England, a gain in males of 14 per cent and in females 22 per cent. That the virulence of the microbe and the susceptibility of the individual to hereditary or acquired phthisis can be most effectually accomplished by hygienic regimen and surroundings, and by the avoidance of all excesses which exhaust primarily the nervous organism and its power of resistance, and so lay the foundation of abnormal action.

Dr. James R. Leaming, of New York, read a paper on "The Philosophy of Climatic Treatment of Diseases of the Chest," in which he stated that according to observation on the effect of climatic resorts, the greatest improvement in persons affected with pulmonary diseases takes place during the first three weeks of the patient's sojourn at a new place. The suggestion was made that a line of resorts be established along the Atlantic sea-coast. The patient could begin in the summer at the most northern and gradually pass southward, making a stay of a few weeks at each place. Having completed the series, the patient may return, taking the stopping places in a reverse order. This same plan might be applied to the Pacific coast and to the mountains. The speaker also suggested the propriety of State and municipal authorities furnishing natatoriums for the benefit of those unable to avail themselves of the advantages of existing institutions.

Dr. G. L. Curtain, of Philadelphia, read a paper on "The Influence of Sea Air on Syphilitic Phthisis." He gave the history of five cases which improved by long sea voyages, but in each case the symptoms returned when the patient again took up his residence on land. He was led to consider them cases of syphilitic phthisis for the reasons that there were no symptoms of chronic pneumonia preceding the attack, that the lung trouble followed syphilitic infection with constitutional symptoms, that the disease was influenced to some extent by constitutional treatment, and that there was no tendency to tuberculosis in these cases. He was not prepared to say why it was that the sea air proved beneficial in these cases, while in most of the ordinary cases of phthisis residence on the sea-coast was not desirable.

In the discussion of this subject, Dr. E. T. Bruen, of Philadelphia, remarked that the benefit of sea air in syphilitic phthisis is probably due to its influence on the catarrhal processes. In catarrhal affections of the mucous membranes in general it had seemed to him that residence at the sea-shore was useful. On the other hand in tubercular phthisis it had seemed that the influence of sea air was disastrous. He was led to make these remarks because he found so many patients with this disease recommended to reside at the sea-shore or to take ocean voyages. He had found that the cases benefited by prolonged sea voyages were those in which there was no inherited tendency to tuberculosis.

Dr. V. Y. Bowditch, of Boston, said he should make a great distinction in speaking of the sea-coast air and the pure air. Cases which could not stand the harsh cold and changeable air of the sea-coast may be benefited by a sea voyage or residence on an island some distance from the shore where the conditions are similar to those which are obtained in a sea voyage.

Dr. F. I. Knight, of Boston, also said that while he was sure that the general feeling is that the coast climate is not suitable for cases of phthisis, yet in several instances he had known patients to improve and gain in weight during a stay at some of the coldest resorts on the New England coast.

Dr. J. C. Wilson, of Philadelphia, said he had had no experience with syphilitic phthisis, but with reference to residence at the sea-coast in the treatment of phthisis he would say that in his experience there are three classes of patients with consumption who cannot go to our exposed Atlantic sea-coast without risk. These are, first, those in whom there is active febrile disturbance ; secondly, those of a highly excitable and nervous organization, and thirdly those who suffer from repeated attacks of spitting of blood.

Dr. Frederic C. Shattuck, of Boston, said that it seemed to him doubtful whether there is such an affection as syphilitic phthisis ; that is to say a destructive process in the lung due to syphilitic virus not due to tubercle. Tubercular phthisis varies so much in its symptoms that the points mentioned could not be relied on. The criterion would be the presence or absence of the tubercle bacillus.

Dr. J. H. Musser, of Philadelphia, said he had never seen a case of phthisis which he considered of syphilitic origin. He had seen only one case in which the lesions bore any resemblance to what we should expect to find in syphilitic phthisis. . . . There were scattered through the lungs innumerable miliary granules not at all resembling miliary tubercles. He was unable to find the bacillus of phthisis ; but, as had already been stated, the failure to find it is no proof of its absence. He would not call this a case of syphilitic phthisis, but rather a case of syphilis of the lungs.

Dr. E. Fletcher, of Chicago, related a case in which the syphilitic manifestations were very prominent. There was consolidation of the lungs, particularly the middle portion of one lung. There was a history of syphilis and distinct cutaneous lesion. The patient had been in Colorado and returned much worse. On his return to a lower altitude, he was put on the use of iodide of potassium, and ultimately apparently recovered.

Dr. W. C. Van Bibber, of Baltimore, read a paper on "The Climates of Point Pinelos, Florida ; and of Comado Beach, California," illustrated by several maps, showing the relations of the places described to the coasts and waters, and the influence of these conditions on the climate, and claiming for both places exceptional salubrity.

Dr. J. H. Musser, of Philadelphia, read a paper on the "Treatment of the Final Stage of Phthisis," in which he referred to the various methods which he had found useful in such cases with no relation to climate.

Dr. Frank Donaldson, of Baltimore, read a paper on the "Causes of Cardiac Failure in High Altitudes." Many patients are sent, for general or special reasons, to high altitudes, and are thereby done great injury, especially if they suffer from any form of functional or organic heart disease. From some experiments with the pneumatic cabinet, he had come to the conclusion that this treatment should not be employed in cases in which there is any valvular disease of the heart or fatty degeneration of its walls. It has been asserted that the cause of cardiac failure in ascending to high altitudes is want of oxygen. He had performed some experiments with reference to this point, and had satisfied himself that respiration at

altitudes within ten thousand feet furnished sufficient oxygen to supply the hæmoglobin. In ascending to high altitudes the pressure of the air within and without the lungs is the same, but on the heart the action is different. The pressure is removed from the outer surface of the heart, while the internal blood-pressure remains the same. Dilatation of the heart walls consequently ensues ; this, in his opinion, was the cause of heart failure under the circumstances.

Drs. B. F. Westbrook and H. F. Williams, of Brooklyn, and Dr. James T. Whitaker, of Cincinnati, in discussing the subject of Dr. Donaldson's paper, accepted his conclusions with regard to high altitudes, but dissented from his inferences in regard to the pneumatic cabinet, which, they claimed, acted differently, producing sedative and beneficial action on patients suffering with mitral stenosis and other conditions of weak heart. Dr. S. S. Cohen said that the inhalation of compressed air in cases of dilated heart has been recommended by Waldenburg and others, and that he had himself recently employed it with benefit in a case of dyspnœa and defective circulation due to dilated heart.

Dr. F. C. Shattuck, of Boston, reported some cases of marked improvement under the general treatment of phthisis, with special reference to alimentation ; Dr. E. T. Bruen, of Philadelphia, read a paper on "Gaseous Enemata," and Dr. B. F. Westbrook, of Brooklyn, read a paper on the "Local Treatment of Diseases of the Respiratory Organs ;" these papers elicited considerable discussion, which, with their subjects, would have been in better place before some pathological society. And here we may be permitted to remark that, however valuable contributions and discussions of this character may be in their professional aspect, they are not calculated to promote the objects of and interest in the Climatological Association which its organization contemplated.

A paper on "Diseased Conditions in which Sea Air is of Doubtful Benefit," by Dr. Boardman Reed, of Atlantic City, was read by title and referred for publication.

(*To be continued.*)

THE AMERICAN MEDICAL ASSOCIATION.

The Thirty-eighth Annual Meeting of this Association was held in Chicago, June 7th–10th. It was remarkable for the large attention, general harmony of its proceedings, and the large amount of work accomplished in the promotion of professional advancement. The address of the President, Elisha H. Gregory, M.D., of St. Louis, on "Cell Antagonism," which immediately followed the hearty welcoming addresses of Dr. Charles Gilman Smith, in behalf of the medical profession, and of Mayor Roche in behalf of the citizens of Chicago, was an unusually comprehensive, though cogent, statement of cell life in the "make up" of organic nature in all its phases, and especially in its application to the human organism as the foundation of all functional activity, symptomatology, and pathology of disease and the means of repair. The report of the Committee on

"Medical and Sanitary Service on Board Immigrant Vessels" was read by A. N. Bell, M.D., of New York, Chairman of the Committee. The report dwelt upon the manner in which the laws are evaded, and also upon the incompetency of the physicians employed by the steamship companies. The report advocated the appointment of a competent assistant medical attendant upon vessels carrying more than six hundred persons in passengers and crews, and that physicians shall promptly give their services without fee in every case of sickness, disease, or accident originating on board and incident to the voyage, to any of the passengers or crew, or to any infant or young child of any such passenger who may require their services; and that medical officers shall be compelled to attend to sanitary examinations of the vessels, and to see to it that passengers' and seamen's quarters shall be kept in a proper sanitary condition; to make daily inspections of all inhabitable portions of the vessel, and daily reports in writing thereon to the master of the vessel, together with such suggestions and recommendations as may be necessary to the preservation of health on board; he shall also exercise constant vigilance in regard to the condition of the provisions and water, and promptly report to the master anything which may appear to him to be deleterious to the

health of any person on board ; that each vessel shall carry a competent medical steward and a good and sufficient supply of medicine ; that physicians of vessels shall be compelled to make a report upon every case of disease, and every case of imbecility or lunacy that may have fallen under their observation on board of vessels of which they may have charge to the health officer of the port at which they arrive, in order to prevent the landing of persons who may become charges upon the State. And for the prompt exercise of these functions and the maintenance of the respect to which such medical and sanitary officers are entitled, they shall be provided with a steward or apothecary competent to dispense medicines under their direction and for their special service ; and their tenure of office, remuneration and right to quarters, subsistence, and attendance shall be upon the same basis and co-ordinate with the purser of the vessel on which they serve. For a violation of these provisions, or either of them, or the disregard of the recommendations made in writing by the medical and sanitary officers as thus required, the company to which the passenger vessel belongs shall be liable to a penalty not exceeding two hundred and fifty dollars in every case. The report closed with special reference to the excessive mortality among immigrants on the voyage, and the necessity for such amendments of the laws governing immigration as the Committee had recommended, and with a resolution directing the Secretary of the Association to transmit copies of the report to the Secretary of the Treasury of the United States, and to both the Senate and House Committees on Commerce, and to urge upon them such action through Congress or otherwise, as will secure better protection to the health and lives of immigrants, and better protection to the United States against the immigration of dependent persons. The report was adopted.

The general session then adjourned, and the afternoon was occupied as usual with the division of work into the several sections.

The second day's general session was occupied first with reports of the Committee of Arrangements and of the special committees. Of these latter, the one of which Dr. N. S. Davis, of Chicago, was Chairman, on "Changes in the Plan of Organization and By-Laws of the Association," elicited

close attention and animated discussion. The important changes recommended: for a permanent General Committee, to hold office for two years, one half to be appointed annually, in the place of the "Judicial Council" and "Nominating Committee," to take charge of all matters hitherto devolved upon the latter; the selection of three members of the profession, eminent in some of its departments, to deliver addresses in the general sessions, one on some topic or topics relating to general medicine, another relating to general surgery, and the third relating to public medicine, including under that head hygiene, sanitation, prophylaxis, education and medical education, instead of the addresses of the chairmen of the several sections, as hitherto, and that these latter deliver their addresses before their respective sections. These, and some minor changes recommended by the Committee, appeared to meet the general approbation of the Association, but after the acceptance and adoption of the report, the legality of this action was called in question on the ground that, according to the constitution all proposed changes require holding over for one year before they can be acted upon. Dr. A. N. Bell, of New York, secured the floor and held that the proposition for the changes in question as just adopted *had* conformed to the requirements of the constitution. It was proposed at the meeting in St. Louis one year ago and was deemed of such importance as to have been referred to a Committee for report, instead of being left with the mover; that Committee has reported, and by vote its report has been adopted. He therefore "moved that it be declared as the sense of the Association that the proposition for the changes in question has been before the Association for one year as required, and that the action taken is in conformity with the constitution." The motion was promptly seconded, and by a vote of 272 to 232 declared carried.

Next followed the address of Dr. J. S. Lynch, of Baltimore, Chairman of the Section on Practice of Medicine, which, though chiefly devoted to advances in the treatment of disease, contained an excellent summary of the progress made in the etiology and prevention of pulmonary phthisis. But while accepting the bacillus tuberculosis as a frequent factor in initiating pulmonary phthisis, he very properly suggests that danger of contracting this disease from unsanitary surround-

ings, and especially from bad air, is greater than the danger of direct contagion.

The third day's general session, after reports of committees, was taken up by the addresses of Dr. F. M. Johnson, Chairman of the Section on Obstetrics and Diseases of Women and Children, Dr. G. H. Rohé, of Baltimore, on State Medicine (for abstract of Dr. Rohé's address see other pages), and an abstract of the address of Dr. G. S. Knox, of Chicago, Chairman of the Section on Diseases of Children ; and the fourth day's general session by the addresses of Dr. J. S. Marshall, Chairman of the Section on Dental Surgery, and Dr. I. N. Quimby, Chairman of the Section on Medical Jurisprudence. Dr. Quimby first gave an outline sketch of medical jurisprudence, tracing its formulation into a concrete science during the present century, but laying special stress on greatly needed legislation for the better exercise of the duties comprehended by coroners, the prevention of fœticide and drunkenness. We purpose a full abstract of this excellent address in a future number.

Of the work of the sections, that which was before those on State Medicine and Medical Jurisprudence was of such importance that its consideration is deferred to a future number, when more space can be devoted to it.

The officers elected and Committee on State Medicine for the ensuing year are as follows :

President, A. Y. P. Garnett, Washington, D. C. ; First Vice-President, Duncan Eve, Nashville, Tenn. ; Second Vice-President, Darwin Colvill, New York ; Third Vice-President, Charles J. O'Hagan, North Carolina ; Fourth Vice-President, A. Stedman, Colorado ; Librarian, C. H. Kleinschmidt, District of Columbia ; Treasurer, R. J. Dunglison, Pennsylvania ; Assistant Secretary, J. S. Ranshoff, Ohio. Trustees of the Journal, L. Connor, Michigan ; E. O. Shakespeare, Pennsylvania ; W. T. Briggs, Tennessee. Judicial Council, J. Murphy, Minnesota ; J. M. Toner, District of Columbia ; J. R. Bartlett, Wisconsin ; A. B. Sloane, Missouri ; X. C. Scott, Ohio ; A. W. McClure, Iowa ; J. W. Stormant, Kansas ; Vacancy Occurring in the Council, J. F. Hibbard, Indiana. (That portion of the amendment of the constitution requiring a General Committee to exercise the duties of the Judicial Council will not be carried into effect until the next meeting.)

To deliver addresses before the Association: on General Medicine—Beverly R. Cole, of California; General Surgery—E. M. Moore, of New York; Public Medicine—J. L. Cabell, of Virginia. Section on Anatomy and Surgery—Chairman, Donald McLean, Secretary, B. A. Watson; Section on State Medicine—Chairman, H. B. Baker, Secretary, S. T. Armstrong; Section on Diseases of Children—Chairman, F. E. Waxham, Secretary, W. B. Lawrence; Section on Oral and Dental Surgery—Chairman, J. Taft, Secretary, Dr. E. S. Talbot; Section on Practice of Medicine, Materia Medica and Physiology—Chairman, D. B. Palmer, Secretary, N. S. Davis, Jr.; Section on Dermatology and Syphilography—Chairman, L. Duncan Bulkley. (Others will be given hereafter.)

Committee on State Medicine.

Alabama, Jerome Cochran, Montgomery; Arkansas, R. G. Jennings, Little Rock; California, J. W. Robertson, Creston City; Colorado, P. Brumond, Idaho City; Connecticut, F. H. Whittemore, New Haven; District of Columbia, G. W. Cook, Washington; Florida, N. D. Phillips, Gainesville; Georgia, T. S. Hopkins, Thomasville; Illinois, E. P. Cook, Mendota; Indiana, T. B. Harvey, Indianapolis; Iowa, George F. Jenkins, Keokuk; Kansas, W. L. Schenck, Osage City; Kentucky, J. A. Larrabee, Louisville; Louisiana, T. G. Richardson, New Orleans; Maine, T. A. Foster, Portland; Maryland, G. H. Rohé, Baltimore; Massachusetts, Grace Wolcott, Boston; Michigan, A. W. Alvord, Battle Creek; Minnesota, C. N. Hewitt, Red Wing; Mississippi, T. R. Trotter, Buckhill; Missouri, Leslie Hall, Marshall; Nebraska, W. M. Knapp, York; North Carolina, Eugene Grissom, Raleigh; New Hampshire, W. P. Porter, Walpole; New Jersey, B. A. Watson, Jersey City; New York, A. N. Bell, Brooklyn; Ohio, F. C. Bain, Kenton; Pennsylvania, A. C. Dunn, Pittsburg; Rhode Island, W. J. Burge, Pawtucket; South Carolina, Thomas Legare, Charleston; Tennessee, Richard Cheatham, Nashville; Texas, J. H. Sears, Waco; Vermont, S. H. Griswold, Rutland; Virginia, H. M. Nash, Norfolk; West Virginia, J. E. Reeves, Wheeling; Wisconsin, J. K. Bartlett, Milwaukee; United States Navy, D. Bloodgood; United States Marine Hospital Service, C. B. Goldsbrough;

Dakota, E. M. Dow, ——; New Mexico, Ross Bailey, Los Vegas.

Next place of meeting, Cincinnati, O. Dr. W. W. Dawson, of that city, was appointed Chairman of the Committee of Arrangements.

The *Medical Journal and Examiner* and the *Medical Standard* deserve great credit for daily editions of full reports of the proceedings of the general sessions and the several sections; and to the newspapers also credit is due for unusually accurate abstract of proceedings from day to day.

And to the physicians and citizens of Chicago the Association is under obligations for and pleasant memories of attentions and entertainments which will be long remembered by all those who availed themselves of the privilege of enjoying their open-hearted hospitalities.

THE AMERICAN MEDICAL EDITORS' ASSOCIATION.

This Association held its annual meeting and banquet at the Palmer House, Chicago, on the evening of June 6th, 1887. Dr. J. W. Shoemaker, of Philadelphia, President, read an address on "Present Abuses in Medical Journalism." The following officers were elected for the ensuing year: President, Dr. William Porter, St. Louis; Vice-President, Dr. Thomas J. McIlvaine, Peoria, Ill.; Secretary and Treasurer, Dr. W. C. Wile, Philadelphia. On motion of Dr. Connor, the officers of the Association constitute a committee to make arrangements for the proposed international meeting of medical journalists, authors and writers, to be held in Washington next year.

MORTALITY AND MORBILITY STATISTICS AT MOST RECENT DATES.

THE EXCESSIVE DEATH-RATE AMONG THE NEGROES OF THE SOUTHERN STATES, and the chief causes which account for it, as shown by an article on other pages of this number, should not fail to attract the attention of the health authorities and others whose province it is to exercise preventive measures among them. The article referred to is by a colored student in the State University, at Louisville, Ky. It is the substance of an address delivered before his fellow-students and the faculty of that institution recently, creditable to the institution

and eminently so to himself. It is sincerely to be hoped that the capacity of this young colored man, so cleverly shown, to deal with the subject, will be promoted and utilized in the greatest degree possible for the benefit of his race.

CALIFORNIA.—The mortality for the month of April, reported by the Secretary of the State Board of Health from 64 towns and cities containing an estimated population of 580,350, was 790. Consumption, 146, which is a marked decrease from March; pneumonia, 41, nearly one half less than for March; bronchitis, 14; congestion of the lungs, 8; diphtheria and croup, 43; typhoid-fever, 12; small-pox, 2, both in Los Angeles.

San Francisco, in a population of 280,000, reports the number of deaths for April, 450; from diphtheria and croup, 31; typhoid-fever, 6; consumption, 73. Death-rate, 19.5. Three cases of small-pox developed in San Francisco, from the steamer City of Sydney, but they were promptly quarantined in the small-pox hospital, and no other cases had occurred up to the date of making up the report. The disease was also believed to be extant at Los Angeles.

CONNECTICUT.—For the month of April, 1887, the mortality and chief causes of death in ten cities were as follows:

Bridgeport, 47; zymotic diseases, 10; phthisis, 6; pneumonia, 4. Deaths under five, 16.

Hartford, 86; zymotic diseases, 8; phthisis, 12; pneumonia, 16; heart disease, 4; nervous diseases, 6. Deaths under five, 22.

Meriden, 34; zymotic diseases, 3; phthisis, 3; nervous diseases, 5; pneumonia, 6. Deaths under five, 15.

Middletown, 22; zymotic diseases, 1; phthisis, 4; pneumonia, 4; nervous diseases, 3; heart disease, 1. Deaths under five, 2.

New Britain, 23; zymotic diseases, 2; phthisis, 5; pneumonia, 3. Deaths under five, 7.

New Haven, 121; zymotic diseases, 17; phthisis, 20; pneumonia, 16; nervous diseases, 17; heart disease, 8. Deaths under five, 40.

New London, 14; zymotic diseases, 1; phthisis, 2; pneumonia, 1; nervous diseases, 3. Deaths under five, 3.

Norwalk, 21 ; zymotic diseases, 2 ; phthisis, 2 ; pneumonia, 9.

Norwich, 37 ; zymotic diseases, 3 ; phthisis, 3 ; pneumonia, 5 ; heart disease, 5.

Waterbury reports for the month of March, deaths, 64 ; from zymotic diseases, 20 ; consumption, 6 ; pneumonia, 7 ; nervous diseases, 6 ; heart diseases, 2. Deaths under five, 30.

In public institutions there were 13 deaths in New Haven, 14 in Hartford and 6 in Middletown. Deducting these from the full number reported gives the following as the annual death-rate for the cities : New Haven, 16.2 ; Hartford, 17.2 ; Bridgeport, 13.1 ; Waterbury, 25.5 ; Norwich, 17.7 ; Meriden, 18.5 ; New Britain, 09.3 ; Norwalk, 15.7 ; Middletown, 16 ; New London 12.00.

The ten cities of the State have an estimated population of over 300,000, or about three sevenths of the whole population of Connecticut. The total mortality in the cities in April was 469, which is an annual death-rate of 18.3 per 1000, based on the estimated populations of the several cities as lately returned to this office by their respective town clerks.

DELAWARE.—*Wilmington* reports 90 deaths during the month of April in a population of 57,000, of which 30 were under five years of age. Death-rate per 1000, 18.95. From zymotic diseases there were 9 deaths, and from consumption, 18.

ILLINOIS.—*Chicago* reports 1204 deaths during the month of April in a population of 720,000, of which 533 were under five years of age. Death-rate per 1000, 20.52. From zymotic diseases there were 242 deaths, and from consumption, 116.

Rock Island reports for five weeks ending April 30th, 26 deaths in a population estimated at 13,655, of which 13 were under five years of age. Death-rate per 1000, 8.37. From zymotic diseases there were 7 deaths, and from consumption, 3.

LOUISIANA.—*New Orleans* reports for April 324 deaths in 176,500 white population, and 194 deaths in 66,250 colored population, making the respective death-rates 22.02, and 35.13 per 1000, and 25.60 for the whole population of 242,750. The deaths from zymotic diseases numbered 83, and from consumption, 56. There were 207 deaths under five years of age.

MARYLAND.—*Baltimore* reports for five weeks ending April 30th, 706 deaths in a population estimated at 417,220, of which 237 were under five years of age. Death-rate per 1000, 17.6. From zymotic diseases there were 65 deaths, and from consumption, 119.

MASSACHUSETTS.—*Boston* Board of Health reports, for 1886, total number of deaths, 9268—350 less than for previous year, giving the annual death-rate per 1000 (400,000), 23.17 against 24.04 for 1885. Zymotic diseases caused 1644, or 17.7 per cent of the total mortality, being the lowest percentage for the last sixteen years. Diphtheria in particular shows a remarkable decrease—329 deaths from it against upward of 500 for the previous year, and an average 436 for the preceding five years. Typhoid-fever, also, from which there were 135 deaths, shows a decrease of 17 deaths from previous year, and the smallest number for any year during the past five years. From measles, 36.40 per cent less than in 1885. The proportion of deaths among children is equally gratifying, 3146, being 248 less than during previous year, and a continuous decrease since 1883, when there were 441 more. Deaths from ten principal causes : consumption, 1607 —17.339 per cent of total ; pneumonia, 778 ; heart disease, 581 ; cholera infantum, 444 ; bronchitis, 420 ; accidental and violent, 371 ; marasmus, tabes, mesenterica, and scrofula, 339 ; diphtheria, 329 ; cancer, 299 ; old age, 268. Houses ordered vacated during year on account of unsanitary condition, 148 ; actually vacated, 37 ; the rest having been put in proper condition before the expiration of the time specified in the notice, the tenants were allowed to remain. Privy vaults abolished during the year, 1557. Of places disinfected during the year consequent upon the discovery of contagious diseases or conditions promotive of them there were 80,898. Fifteen analyses of well waters were made, of which two wells only were found to contain water that was fit for use. The great value of the new sewerage system is more and more apparent, but there are still a large number of dwelling-houses in the outlying districts constrained to the use of cesspools and privy vaults, which constantly threaten the health of the people by soil soakage. Of waste matters, 300,000 loads, or about 13,000,000 cubic feet, are given as an approximate estimate of the amount during the year requiring

the consideration and action of the board for its proper disposal. Cremation is cited as a great advance on previous methods of disposal, and recommended as eminently worthy of trial in Boston. Of 174 school-houses inspected, 149 were found to be in good sanitary condition, and the defects in the rest appear by the reports to have been of such a character as to admit of comparatively easy correction. With regard to the danger of introducing infectious diseases by means of—

Foreign rags, the report expresses the gratification of the board at having its excellent ordinance requiring that all such rags should be disinfected endorsed by the Pennsylvania State Sanitary Convention, though "on the petition of a large number of the importers of foreign rags and others interested in the foreign rag trade," it straightway showed that it attached more importance to the wishes of those interested in the foreign rag trade than it did to the judgment of the Pennsylvania State Sanitary Convention, which consisted "of some of the ablest men in the country," and straightway repealed or so modified the said ordinance as to suit the rag trade and encourage the diffusion of infectious diseases. Excepting this remarkable inconsistency, the report is a singularly cogent exhibition of a high standard of municipal sanitation.

Lowell Board of Health reports for the year 1886: Marriages, 1886—increase, 123; births, 1883—increase over previous year, 114; deaths, 1499—increase, 171—21.4 per 1000, of an estimated population of 70,000. Six hundred and eighteen, or 41 per cent, were under five years of age. While contagious diseases are said "not to have prevailed in an epidemic or malignant form," 387 deaths from zymotic diseases is a large proportion, and of this class 53 from typhoid-fever and 85 from diphtheria and croup are especially suggestive of local conditions promotive of epidemics, abundantly indicated by the character of the nuisances with which the board has had to contend. Of 822 reported, 681 were "privy vaults full." The board fully appreciates this loathsome practice of storing filth, and quotes from the report of 1880 that "the privy-vault system of our city is in the worst possible condition. Hundreds of these vaults are old and decayed. The contents of many of them have leaked out into the ground, until the earth about them is thoroughly saturated, and has become the source of the most

poisonous miasma. How long this contamination can continue without serious results is only a question of time." Meanwhile the population has increased about 6000, and presumably the privy vaults in the same proportion; for with regard to sewerage the board reports, "The central parts of Lowell are pretty well provided for, but not so with some of the outskirts. Population has been rapidly extending in certain directions, so that there are large numbers now who have no sewer accommodations. In these localities the streets, yards, and grounds can neither be suitably drained nor can their sink and privies have a proper outlet. The sanitary condition of these neighborhoods is suffering from this source, and there can be no doubt but this is one of the causes of our large mortality. Petitions have been sent into the city government from these localities, and hearings had upon them, but for two years very little comparativly has been done in this direction. In behalf of the sanitary interests of our city, several sewers should by all means be built this year."

Boston reports 842 deaths during the month of April in a population of 400,000, of which 699 were under five years of age. Death-rate per 1000, 25.2. From zymotic diseases there were 109 deaths, and from consumption, 128.

MICHIGAN.—State Board report for the month of April has not been received. At the meeting of the State Medical Society in Lansing, May 13th, Dr. H. B. Baker, Secretary of the State Board of Health, submitted an interesting statement of

Practical results of measures for restricting diphtheria. He presented a table and a diagram based on a compilation of reports by local health officers in Michigan for the year 1886, which showed the results of isolation and disinfection in outbreaks of diphtheria.

In 102 outbreaks where isolation or disinfection or both were neglected, the average *cases* per outbreak were a little over 16, and the average *deaths* were 3.23; while in 116 outbreaks in which isolation and disinfection were both enforced, the average *cases* per outbreak were 2.86, and the average *deaths* were .66; indicating a saving of over 13 cases, and 2.57 deaths per outbreak, or 1545 cases and 298 deaths during the

year, by isolation and disinfection in the 116 outbreaks, compared with those in which nothing was done.

Detroit report not received.

MINNESOTA *Bulletin* for April reports, infectious diseases: diphtheria, 3 cases, 14 deaths; scarlatina, 44 cases, 10 deaths. Measles of mild type, prevailing generally throughout the State. Diseases of animals: Glanders, remaining on hand isolated or not accounted for at first of month, 17; reported during the month, 10; killed, 4; released, 7. Remaining, May 1st, isolated or not accounted for, 16.

St. Paul reports 164 deaths during the month of April, in a population of 125,000, of which 95 were under five years of age. Death-rate per 1000, 15.74. From zymotic diseases there were 43 deaths, and from consumption, 9.

MISSOURI.—*St. Louis* reports 666 deaths during the month of April in a population of 420,000, of which 226 were under five years of age. Death-rate per 1000, 19.02. From zymotic diseases there were 124 deaths, and from consumption, 78.

NEW JERSEY.—The Tenth Annual Report of the State Board of Health, and the Report of the Bureau of Vital Statistics for 1886, make a volume of 464 pages. It is gratifying to observe that sewage disposal is of primary importance, and has made considerable progress. Atlantic City is felicitated upon "the energy with which a few of the citizens have pushed forward the enterprise" (of the West System), "and have thus rid this growing centre of the cart and cesspool nuisance which once threatened its health and its fair fame." . . . But the present miserable apologies for filter-beds in their present locality, "in a meadow in the outskirts of the town" are deservedly characterized as disgraceful. It is surprising that such structures, in such a place, should have been permitted by the health authorities, or that they should have been tolerated for a single month after their erection. They are an odious example of "contractors' sanitation," but the contractors in this case, as we are informed from other sources, excuse themselves on the plea of temporary emergency until a better site may be obtained upon which to erect filter-beds in keeping with the system. Trenton is said to be well under way toward

beginning an acceptable plan "for a complete sewerage of the entire city," which hitherto appears to have almost wholly depended upon cesspools and privy vaults. Pollution of rivers, public water supplies, water as affected by lead pipes and the filtration of water, bathing accidents, importation of rags, regulation of cemeteries, hydrophobia, small-pox and vaccination, summer resorts, sanitary control of communicable diseases, sanitary oversight of schools and sanitary education by health inspectors, diseases of animals as related to human health, and bovine scarlatina, are the sub-heads of remarks in the secretary's summary, but without anything new. The "Pottersville Sickness," in June last, when 200 citizens of Pottersville, who had attended a church festival and eaten of ice cream, and the "Long Branch Milk Sickness" in August last, where a number of cases of sickness were caused by partaking of milk of a particular dairy, are described—the poison in both cases being attributed to *tyrotoxicon*. Next follows the series of papers read at the meeting of the State Sanitary Association, at Trenton, in November last, which have already been reviewed, and some of them published entire in our pages. Abstracts of local boards' reports follow, giving numerous examples of excrement storage, soil soakage, and contamination of wells, with the usual results, typhoid-fever, diphtheria, and other filth diseases. Soil moisture and wet cellars are also common conditions reported upon, and malarial diseases proportionally prevalent.

Report of the Council of Analysts on Carbon Dioxide in School-room Air, by Professor Albert R. Leeds, chairman, "revealed the fact that the amounts of carbon dioxide were usually in great excess of that which should be present in well-ventilated rooms." This is very far from being a new revelation. Indeed, it has long been a fact of common knowledge throughout the country, and the health authorities, with very rare exceptions, appear to be only equal to the trivial task of frequently reporting it.

The Report of the Milk Inspector, W. K. Newton, M.D., finds no new advances in the chemistry of milk during the year, unless the isolation of Professor Vaughan's discovery, tyrotoxicon, may be so regarded. After weighing all the facts in the investigation of the Long Branch milk-poisoning, he concluded

that the development of tyrotoxicon was "due to the improper management of the milk—that is, too long a time was allowed to elapse between the milking and the cooling of the milk; the latter not being attended to until the milk was delivered to the hotel; whereas, if the milk had been cooled immediately after it was drawn from the cows, fermentation would not have ensued, and the resulting material, tyrotoxicon, would not have been produced."

"Report of Vital Statistics" comprehends 100 pages, the most interesting portion of which is a contribution of 30 pages on the "Relation of the Physician and the Sanitarian to Heredity, with Statistics as to It," by Laban Dennis, M.D., of Newark. This paper is evidently the result of extensive reading, and it is rather overloaded with citations from works that have been published on the subject—good, bad, and indifferent—with too little discrimination with regard to authorities; hence, there is scarcely a disease, habit, or vice with which an individual may be afflicted, or to which he may be addicted, for which his own will may be held responsible. However true it may be, from a physiological standpoint, that the formative capacity of the original constitution of each individual is more or less due to the constitution of the parents, this truth has its limitations chiefly to diatheses, and to modifications of nervous organization which predispose to special aptitudes. But in general, health and sickness, as habits good and bad, virtue and vice, are much more dependent upon the will of the individual and the power exercised to restrain or cultivate it, as the case may be, despite environment, than upon heredity. Indeed, to such a degree is this the case that even the most marked hereditary tendencies may be overcome by the persistent exercise of the power of the will, and this it is which should be urged in the promotion of health, virtue, and happiness. "Infant Mortality" is discussed by the Secretary with special reference to the relations of unwholesome feeding and unsanitary surroundings as chief agents in its promotion. An apt illustration is quoted from an inquiry made by E. H. Jenkins, Ph.D., with regard to New Haven (Health Officer's Report, 1885): "Of 111 children who died of infantile diarrhœa, 14 were nursed entirely by their mothers, 12 others were nursed less than 1 month, 5 between 1 and 2 months, 2 between 2 and

3 months, 3 between 4 and 5 months, and 3 between 6 and 9 months. Five were both nursed and bottle-fed, and of 13 cases the particulars are not known. Fifty four were not nursed at all. That is, out of 98 cases, 14.3 per cent were children nursed by their mothers ; 77.5 per cent were children bottle-fed wholly or in part from the time they were 2 months old ; 8.2 per cent were children who were longer nursed than the others, but were bottle-fed at the time they were taken sick."

Tabulated statistics follow which aggregate for the year ending June 30th, 1886 : Marriages, 12,351 ; births, 25,497 ; deaths, 22,734 ; " of which numbers, as to marriages at least, 2600 belong to adjacent States." Owing to the dissociation of population with regard to these statistics, it is not practicable to deduce the ratios with sufficient certainty to justify their publication. So, too, with regard to deaths from special diseases as related to total mortality. Indeed, diffusiveness and interspersion of foreign matter, except some of the special reports, is a prominent characteristic of the volume.

Hudson County reports 466 deaths during the month of April, in a population of 258,000, of which 180 were under five years of age. Death-rate per 1000, 21.4. From zymotic diseases there were 60 deaths, and from consumption, 54.

Newark reports for the month of April : population 162,299, deaths 306, of which 105 were under five years of age. From zymotic diseases, 75 ; consumption, 43. Death-rate, 22.66.

Mount Holly has recently been stirred up by the recurrence of a number of cases of *typhoid-fever* due to the usual cause. In several instances it was traced almost directly to the cesspools on the premises, which were located within ten or fifteen feet of the houses, and the porous condition of the earth permitted the soakage from the cesspools to be carried into the cellars, and the emanations therefrom pervaded the houses. Many of these receptacles have not been cleaned out for years, and consequently the soil round about is saturated with filth.

Besides, at *Smithville*, about two miles from Mount Holly, all of the sewage, waste water, etc., from houses where there were persons suffering with the disease was drained into the Rancocas Creek, and it was from this stream that the people of Mount Holly obtained their supply of drinking-water.

NEW YORK.—The total reported mortality by State Board *Bulletin*, of 122 cities and towns, comprising 3,127,917 inhabitants, for the month of April is 7967 ; of which 30.6 per cent were under the age of five years. From zymotic diseases there were 1086 deaths, a ratio of 136.20 per 1000 total mortality. From diarrhœal diseases, the ratio per 1000 deaths is 14.00 ; from typhoid-fever, 7.00 ; from croup and diphtheria, 60.00. *Small-pox* in New York, 12 (deaths) ; Brooklyn 19 cases ; Sing Sing and New Rochelle, in each one case—both imported. *Diphtheria* epidemic in Victor, *scarlatina* in Mechanicsville, and *measles* in Newburg. From consumption the ratio of mortality is 145.25 and 276.46 per 1000 above the age of five years. The combined death-ratio per 1000 from zymotic diseases, consumption, and puerperal diseases, is 399.00. From acute respiratory diseases there were 167.62 deaths per 1000 total mortality.

New York City, 1,481,920 : Deaths for the month, 3287 ; under five years, 1171 ; of zymotic diseases, per 1000, from all causes, 160.63. By croup and diphtheria, 271 ; typhoid-fever, 11 ; measles, 43 ; malarial diseases, 23 ; whooping-cough, 10 ; small-pox, 12 ; consumption, 504 ; acute respiratory diseases, 646. Death-rate, 27.00.

Brooklyn, 690,000 : Deaths, 1354 ; under five years, 482 ; of zymotic diseases, per 1000, from all causes, 152.14. By croup and diphtheria, 101 ; typhoid-fever, 2 ; malarial diseases, 25 ; whooping-cough, 6 ; scarlet-fever, 25 ; measles, 27 ; small-pox, 19 cases, no deaths ; consumption, 195 ; acute respiratory diseases, 249. Death-rate, 23.87.

Buffalo, 202,000 : Deaths for five weeks, ending April 30th, 425 ; under five years of age, 159 ; from zymotic diseases, per 1000, from all causes, 150.58 ; croup and diphtheria, 27 ; typhoid-fever, 4 ; consumption, 51 ; acute respiratory diseases, 67. Death-rate, 21.80.

Rochester, 110,000, month of April : Deaths, 165 ; under five years, 48 ; of zymotic diseases, per 1000, from all causes, 127.27. By croup and diphtheria, 8 ; consumption, 28 ; acute respiratory diseases, 27. Death-rate, 18.00.

Increase of Insanity in New York.—There were, on October 1st, 1886, in the various asylums of the State, 13,533 patients

against 12,707 at the corresponding period of 1885, showing an increase of 826 during the year.

NORTH CAROLINA.—Monthly bulletin for April reports from 38 counties; measles prevailed more or less in 25, but with the exception of Montgomery, where there had been a few cases malignant and fatal, of a mild type. Whooping-cough in 15 counties; diphtheria in one; scarlet-fever in one, and typhoid-fever in six. Hog-cholera was reported in Tyrrell County, and an epidemic of distemper among horses in Camden County. County public buildings in general, in good condition.

Vital statistics for the chief cities during the month as follows:

Wilmington: population—whites, 9900; colored, 13,500—23,400. Death-rates: white, 15.8; colored, 26.6: 22.1.

Charlotte: population—white, 6000; colored, 5000—11,000. Death-rates: white, 22; colored, 28.8: 25.1.

Asheville: population—white, 5625; colored, 1875—7500. Death-rates: white, 21.3; colored, 19.1: 20.8.

Fayetteville: population—white, 2500; colored, 1800—4300. Death-rates: white, 4.8; colored, 40.0: 19.5.

Raleigh: no report.

OHIO.—Weekly health bulletin for five weeks ending May 6th, from 48 counties, reports cases of measles, 1207; diphtheria, 117; scarlet-fever, 87; whooping-cough, 98; typhoid-fever, 27; typho-malarial-fever, 57. Compared with the preceding four weeks, measles increased 106 cases, scarlet-fever, 8, typhoid-fever, 16, and typho-malarial-fever, 15 cases; diphtheria decreased 37 cases, whooping-cough, 26. Two cases of small-pox appeared at Farmersville, Montgomery County, May 20th, among Italian laborers who landed in New York from Naples, May 6th, reaching Farmersville May 14th.

Cincinnati reports 483 deaths during the month of April, in a population of 325,000, of which 61 were under five years of age. Death-rate per 1000, 17.56. Deaths from zymotic diseases, 85; diphtheria and croup, 24; typhoid-fever, 10; measles, 10; from consumption, 89.

Cleveland reports 297 deaths during the month of April, in a population of 210,000, of which 121 were of children under

five years of age. Fifty-nine were caused by zymotic diseases; measles, 20; diphtheria and croup, 14; consumption, 41. Death-rate per 1000 of population, 15.25.

Columbus reports for the month of April, in a population of 75,000: deaths, 85; under five years of age, —; from zymotic diseases, 9; consumption, 25. Death-rate, 14.86.

Toledo reports 85 deaths during the month of April, in a population of 73,000, of which 14 were under five years of age. Death-rate per 1000, 13.97. From zymotic diseases there were 12 deaths, and from consumption, 23.

Dayton reports for the month of April, in a population of 49,000: deaths, 63; under five years of age, 16; from zymotic diseases, 5; consumption, 10. Death-rate, 15.18.

PENNSYLVANIA.—*Philadelphia* reports for five weeks ending April 30th, 2414 deaths in a population estimated at 903,801, of which 985 were under five years of age. Death-rate per 1000, 27.7. From zymotic diseases there were 298 deaths, and from consumption, 323.

Pittsburg reports for three weeks ending April 16th, 273 deaths in a population estimated at 210,000, of which 131 were under five years of age. Death-rate per 1000, 22.7. From zymotic diseases there were 41 deaths, and from consumption, 25.

Erie reports 45 deaths during the month of April, in a population of 33,215, of which 15 were under five years of age. Death-rate per 1000, 16.25. From zymotic diseases there were 4 deaths, and from consumption, 5.

RHODE ISLAND.—The Thirty-third Report upon the Births, Marriages, and Deaths in the State of Rhode Island, with a population of 304,284, for the year ending December 31st, 1885, prepared by Charles H. Fisher, M.D., Secretary of the State Board of Health and State Registrar of Vital Statistics, is a document of 198 pages, almost wholly statistical. The general results of the registration are:

Births: males, 3591; females, 3437; American parentage, 3497; foreign, 3531—whole number 7028. Rate per 1000, 23.1. Marriages: American groom and bride, 1374; foreign-born groom and bride, 677; American groom and foreign bride, 236; foreign groom and American bride, 201—whole

number 2488. Rate per 1000, 16.3. Divorces: 227—one divorce to about every eleven marriages. Deaths: males, 2607; females, 2782; American, 2765; foreign, 2624—whole number 5389. Rate per 1000, 17.7. Compared with the last five years preceding, the fluctuations in the birth-rate have been less than two per 1000 of the population, the lowest being 22.8, in 1880. Of marriages there has been a decrease since 1880 of ten per cent, while the population from June of that year has increased ten per cent. The decrease from the number of the previous year was 70. Of divorces, the proportion is smaller than during any year since 1878; but relatively larger for the last three or four years in consequence of the decrease in the number of marriages. In 1880, the ratio of marriages per 1000 of population was 20; in 1885 (with an increase of ten per cent in population), the ratio was 16.3.

Of deaths, the number for 1885 was the largest ever registered, and .9 per 1000 larger than the average for the last five quinquennial census years, 1860 to 1885. The highest death-rate was in 1885—18.4; the lowest in 1870—14.9. By a comparison of the numbers for a series of years, the greatest mortality occurs during the third quarter in the year, chiefly from the excess at that season among children. The average age of decedents, for five-year periods, 1860–84 has been: 29.71; 31.58; 30.30; 31.29; 33.24. The average for 1885 was 33.53, an increase of about ten months over that of the preceding year.

Of the causes of death, consumption is not only the leading but more than twice that of any other, being for the year 1885, 781 or 14.49 per cent of the number from all causes, but .26 per cent less than the average for the last seven years; there has been a notable diminution in the ratio of mortality from consumption during the last twenty years, particularly among those of American parentage, among whom the ratio of deaths from this cause is about one third less than among those of foreign parentage. Pneumonia, 467; diarrhœal diseases, 399; heart disease, 349; apoplexy and paralysis, 289; old age, 267; cancers, 193; diphtheria and croup, 193; brain diseases, 189; accidents, 173; fevers, 158; scarlet-fever, 91. The mortality from cancer is largely in excess of any previous year, and has rapidly increased in proportion to population as compared with previous years. Pneumonia, also, shows a

larger mortality and a larger proportion to population than in any previous year—8.6 per cent of the deaths from all causes.

Providence reports for the month of April, 1887, population 121,500 : deaths 215, of which 73 were under five years of age. From zymotic diseases, 48 ; consumption, 30. Death-rate, 21.33.

TENNESSEE *Bulletin* reports : "The principal diseases named in the order of their greater prevalence in the State for April, were malarial-fever, acute lung diseases, typhoid-fever, catarrhs, consumption, rheumatism, dysentery, and tonsillitis." Measles are reported in 32 counties ; whooping-cough in 14 ; mumps in 8 ; roseola in 7 ; scarlet-fever in 5 ; diphtheria and croup in 4 ; meningitis in Blount, and dengue in Madison.

In the chief cities the respective death-rates for the month, per 1000 of population, annually, are reported as follows :

Chattanooga,	white,	15.60 ;	colored,	32.40 : 21.20
Clarksville,	"	70.20 ;	"	32.00 : 16.50
Columbia,	"	20.07 ;	"	45.18 : 31.04
Knoxville,	"	30.29 ;	"	46.32 : 33.87
Memphis,	"	14.02 ;	"	28.77 : 19.25
Nashville,	"	13.10 ;	"	28.88 : 18.80

The mean temperature for the month was 59°.13, slightly above the mean for the past five years. The highest temperature was 93°, on the 8th. The lowest temperature was 21°, recorded on the 5th, and was very near the mean minimum reported in the period above named. The mean precipitation was 2.86 inches, the least for April during the past five years, except in 1885, when the mean was 2.75 inches, much below the normal for April.

VIRGINIA.—*Richmond* reports for April 65 deaths in 56,000 white population, and 80 deaths in 44,000 colored population, making the respective death-rates 13.7 and 21.7 per 1000, and 17.40 for the whole population of 100,000. The deaths from zymotic diseases numbered 16, and from consumption, 20. There were 56 deaths under five years of age.

WISCONSIN.—*Milwaukee* reports 257 deaths during the month of April, in a population of 180,000, of which 65 were

under five years of age. Death-rate per 1000, 17.1. From zymotic diseases there were 38 deaths, and from consumption, 31.

INFECTIOUS DISEASES AND DEATH-RATES ABROAD.—From Surgeon-General Hamilton's weekly abstract of consular reports received through the Department of State, and from foreign correspondence direct, the following is a condensed statement of reports received since May 12th :

Cholera.—In South America : Callao. The United States Consul, in his dispatch dated April 1st, encloses copies of cable messages from Chili, "from which," he states, "the Department will perceive that the ravages of the cholera in that republic have almost ceased. I am informed through private sources that the interdiction between Santiago and Valparaiso has been suspended, and that steamers sailing from Valparaiso for ports on the south Chilian coast are no longer subjected to observation and delay in the ports of their destination ; but from what I am able to learn in an unofficial manner here, since this information referred to is not official, the Board of Health has determined to continue prohibiting the entrance of vessels from Chilian waters."

Valparaiso.—United States Consul, by cable message dated May 12th, states that "official declaration has been made of the disappearance of cholera (presumably as an epidemic) at that port.

"Peru has so far escaped the pestilence, and we are in hopes that all danger has passed. But the same strict sanitary regulations and precautions are still observed, and the Board of Health has given no expression of a change of programme since the information above referred to was received. The health of Lima and Callao is satisfactory."

"Valparaiso, April 12th, 1887.—It has been officially declared that the cholera has disappeared from this port. There are only one or two isolated cases."

"Santiago, April 13th.—during the last twenty-four hours there have been 4 new cases of cholera, and 4 deaths in the suburbs of this city."

Buenos Ayres.—Twenty-three hundred and thirty-three deaths were registered during the two months ending February 28th, 1887, including 576 from cholera, 19 from small-

pox, 61 from enteric-fever, 20 from scarlet-fever, and 53 from diphtheria. It is reported that cholera disappeared in the month of March.

Catania.—The United States Consul, in his dispatch dated April 8th, in reference to cholera, states that "I am now glad to be able to report that the malady has ceased. The disease was first declared to be cholera on the 28th of February last. Soon after quarantine was established against the island of Sicily by the Government of Italy. The people were greatly alarmed, and those who could get away fled. . . . At no time did the disease assume alarming proportions. The greatest number of cases reported in any one day was only seven. The disease seemed to be without epidemic features. The cause was attributed to the water of the wells, which was declared to be infected. The municipal authorities ordered the wells closed. The aqueduct for conducting water to the city from the slopes of Etna was completed by the 15th of March, . . . and after the 22d of March no more cases of cholera were officially reported. The whole number of cases officially reported was 83, and the number of deaths 51."

Greece, Athens.—The United States Consul, under date of April 22d, states that "the strict quarantine enforced to this date against all arrivals from Sicily (viz., 11 days) is now reduced to a simple medical visitation, except in regard to arrivals from Catania."

Calcutta.—Seventy-seven deaths from cholera were registered during the month of January, 1887, against 290 in the preceding month. During the month of February there were 83 deaths from cholera. During the two weeks ending April 9th, there were 136 deaths from cholera.

Hiogo.—During the week ending March 13th, one death from cholera.

Small-pox.—Deaths reported from small-pox in foreign cities during the five weeks ending May 21st, 1887, as follows: London, 1; Paris, 57; Lyons, 2; Nantes, 4; Havre, 10; Rheims, 5; Marseilles, 22; months of March and April: Amiens, 2; Anvers, 3; Alost, 1; Marchiennes-au-Pont, 3; Vienna, 11; Pesth, 53; Prague, 36; Trieste, 13; St. Petersburg, 15; Warsaw, 18; Venice, 11; Cairo, 1; Alexandria, 13; Suez, 1; Rome, 55; Milan, 43; month of February: Saragossa, 21; months of March and April: Nice, 11; Turin,

15; Buenos Ayres, 34; February and March: Havana, 6; Guayaquil, week ending April 7th, 13.

Yellow-fever, Havana.—During the month of April, 21; week ending May 5th, 8. Guayaquil: During the week ending April 7th, 12; week ending April 21st, 4; during the week ending May 6th, 8.

Key West.—The medical officer in charge of the Marine Hospital Service at Key West (Passed Assistant-Surgeon A. H. Glennan), under date of June 4th, reports a total of 15 cases of yellow-fever, including a few cases of "suspects," and 4 deaths. "Two cases have been reported from newspaper offices, one at the jail last night, and one at the hotel this morning. So far all patients have been promptly isolated by removal to the Barracks Hospital since its organization, and the Board of Health have done everything in their power to prevent the spread of the disease." The President of the Key West Board of Health, Dr. J. Y. Porter, reported by telegraph, under date of June 5th, that "fever has ceased to be sporadic, and absolute segregation of patients in hospital impossible, as friends conceal cases, and violently oppose removing sick; therefore, for these reasons, the Board will declare the disease to be fast assuming an epidemic character. Total cases to date, 17; deaths, 5."

"Atmosphere Purifier."—Under this caption the following excerpt, probably because of its foreign source (credited to the Berlin Medical Association), is heralded by the medical and popular press as an especially useful air purifier for the sick-room:

Take of

Oil rosemary	10.0 parts.
Oil lavender	2.5 parts.
Oil thyme	2.5 parts.
Nitric acid	30.0 parts.

Shake well before using. Saturate a sponge, and place in convenient position for spontaneous evaporation.

Listerine, prepared by the Lambert Pharmacal Company, St. Louis, which we have before had occasion to recommend, is, in our judgment, far better adapted to the purpose. It consists of the essential ethers and oils of thyme, eucalyptus,

baptisia, gaultheria and mentha arvensis, in combination with benzo-boracic acid. The vapor evolved by its use in the sick-chamber by means of saturated cloths, sponge, or spray is actively ozonifying and rapidly oxidizing in its effects on organic matter afloat in the sick-chamber, while at the same time it imparts a grateful odor to the atmosphere.

A NEW REFRIGERATOR.

78 WASHINGTON PLACE, NEW YORK CITY, June 1, 1887.

To the Editor of THE SANITARIAN : DEAR SIR : I notice on the cover of THE SANITARIAN for May an advertisement that strikes me as something entirely new in the way of household refrigerators. It claims a stoneware lining without seams, and glazed surface. Do you know anything personally of the merits of these refrigerators ?

Respectfully, F. A. STUMM.

Personal use of one of the refrigerators referred to by our correspondent has satisfied us that the refrigerator is all that it claims to be—and that is a good deal. It is constructed of such material and in such a manner as to thoroughly adapt it to its main purpose of keeping ice ; while, by the complete separation of its compartments with glazed stoneware linings, commodious doors which admit of easy inspection and effective air ducts throughout ; cleanliness, purity, and wholesomeness are promoted to a degree surpassing that of any other family refrigerator that has ever fallen under our observation.

UNCERTAIN CORRESPONDENTS.—We frequently receive abstracts of reports of boards of health, copies of legislative enactments, and other important matter, without any means of identifying the source or place of application. For example, we have now before us : " An act to establish local boards of health, and to protect the people of this State from contagious diseases," which is excellent, but the name of the State is nowhere mentioned in the " Act," the sender omitted to send his name, and the post-office stamp on the envelope was not sufficiently distinct to be read. The same imperfection is not uncommon to " Report of the Health Officer for the week or month of," and some even " for the year," without naming the place or even the State.

LITERARY NOTICES.

PRINCIPLES OF HYGIENE, TOGETHER WITH THE ESSENTIALS OF ANATOMY AND PHYSIOLOGY. By EZRA M. HUNT, A.M., M.D., Sc.D., Tenth President of the American Public Health Association, Secretary of the State Board of Health of New Jersey, and Instructor in Hygiene in New Jersey State Normal School. 12mo, 382 pages, cloth, illustrated. New York: Ivison, Blakeman & Co. This little volume is a decided departure in both substance and arrangement from the large number of books on physiology and hygiene for schools and amateur readers hitherto published, and the departure is altogether to its advantage. It is the only one that has fallen under our observation that gives hygiene the precedence it deserves, and eschews the excess of anatomy and physiology common to all the rest. It treats of the functions and senses of the human body with special reference to the best means of promoting their healthy exercise, and the acquisition of such knowledge as will serve to protect the learner against the dangers of impure and unwholesome food and drink, improper clothing, foul air, unhealthful surroundings, and intemperance. No book on the subject with which we are acquainted is so well adapted to the comprehension of the advanced pupils of our public schools—which should make haste to introduce it.

THE CREMATION OF THE DEAD: Considered from an Æsthetic, Sanitary, Religious, Historical and Economical Standpoint. By HUGO ERICHSON, M.D., Licentiate of the Royal College of Physicians and Surgeons of Kingston, Canada, Member of the Committee of Organization of the First International Cremation Congress, etc., etc. With an Introductory Note by Sir T. Spencer Wells, Bart., F.R.S., etc., England. Illustrated. 12mo, pp. 258, $2. Detroit, Mich.: D. O. Hayes & Co. We have here a concise historical sketch of cremation, and a condensed statement of the dangers of interment, with some examples of fatal epidemics as the re-

sult, together with the advantages of incineration and a description of the means by which it may be most effectually and satisfactorily accomplished. The subject is well known to be of increasing interest, above all to populous places, and the work before us is both timely and instructive, especially worthy of the attention of sanitarians, and should be read by all persons who take an interest in the subject.

SCRIBNER'S MAGAZINE for July contains a paper on "The Physical Proportions of the Typical Man," by Professor D. A. Sargent, M.D., of Harvard College, who is, perhaps, the best authority in this country on the general subject of athletics. In it he gives a standard of physical measurement, based on the measurements of ten thousand individuals. This furnishes a basis of comparison by which any person can gauge his proportions with those of the typical man. The article contains charts for this purpose.

SUMMER RESORTS.—The *Home Journal* of June 15th is a particularly interesting directory for persons who are in search of summer resorts. But it is well to bear in mind that the outside attractions here so profusely displayed are no indication of healthful conditions within and round about. On the contrary, some of the most gaudily displayed are "full of dead men's bones." A competent sanitary inspector's certificate of recent date is the best safeguard for a healthful sojourn we know of; and those resorts only which can furnish it are worthy of patronage.

TRADE JOURNALS, DISGUISED AND UNDISGUISED.—A new, cheap, and effective plan of advertising has lately been discovered, and liberally applied to and upon the medical profession. It is a most admirable plan for the advertiser, because the public to which he addresses himself is quietly hoodwinked into paying for the advertisement!

The simple method to which we refer is for a firm which manufactures some medicinal or dietetic preparation suddenly to discover a "long-felt want" of the profession for a new journal, and forthwith to supply the want by establishing a periodical.

The peculiarity of such periodicals is that in the most innocent and casual manner they are always introducing some complimentary allusion to the articles manufactured by the firm which puts up the cash ; and never by any chance is anything admitted criticising those articles, or in praise of a competitor.

These journals are usually put at a low price, fifty cents or a dollar a year, and always contain a certain amount of really excellent matter borrowed from other journals or bought by the proprietors. This portion is the make-weight for the concealed advertising, which is liberally and artfully scattered through the pages.

There are dozens of such journals in the United States, for which physicians pay the cost, and which in truth are nothing more than advertising sheets, and their claims to an independent scientific position are preposterous and absurd. One is before us now, which on the title-page professes to be "devoted to investigations into the pathology and physiology of digestion, and the relations of regimen to practical medicine." In reality it is devoted to the advertising of somebody's malt extract, and anybody who sends in a contribution reflecting on that extract would soon learn how much or how little such investigations are accepted in the spirit of science.

All such publications sail under the banner of false pretence ; they are dishonest in spirit, and if rightly understood reflect discredit on the house which supports them. Open advocacy is one thing ; disguised advertising under the simulation of scientific investigation is another and much less creditable thing. We warn readers against this commercial trick.—*Medical and Surgical Reporter.*

BUT physicians are by no means scot-free in the enterprise here referred to by our esteemed contemporary. There is more than a "baker's dozen" of such journals whose object plainly is to acquire libraries by means of exchanges and books for review. The "ad" pages are sold to, and the publication not infrequently conducted by agents to cover the expenses, and the editing commonly done with scissors and transpositions, requiring but little time and no talent—except of the baser sort.

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